Confronting and Changing Racialized Patterns of Not-Seeing Black Children: Narrowing the Gap Between Observation and the Work of Teaching Mathematics in the Context of Practice Based Professional Development

by

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Dedication

This dissertation is dedicated to my first friend, my first prayer partner, my first teacher.

Olivia Allen

Mom, we did this, I love you!

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A central theme that runs throughout this dissertation is that Black students do not need to earn the right to be seen as brilliant, good, worthy, and infinitely capable. Instead they should be able to just show up in any space, and their brilliance should be taken as axiomatic. This dissertation is a testament to all of the people who allowed me to show up in all types of spaces and places as a brilliant Black girl. I have been incredibly blessed to have the support of a community of thoughtful and amazing mentors, colleagues, students, and friends, who have helped me develop as a teacher, a teacher educator, a scholar, and Christian.

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- I can do all things through Christ who strengtheneth me. (Philippians 4:13)
- If any of you lacks wisdom, you should ask God, who gives generously to all without finding fault, and it will be given to you. (James 1:5)

You all are my heartbeat. It does not matter what I say I want to do or where I want to go, you each support me unconditionally. I adore each of you. Your love has literally followed me around the world. When I think of home, you are all there. I am looking forward to taking you on more adventures as I move on to what's next.

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Abstract

Black children are brilliant. They are infinitely capable of learning. However, as a result of the racialized sociohistorical contexts of schools and teaching, Black students are rarely seen as brilliant or perceived as capable in classrooms. Thus, professional development must create and structure opportunities for teachers to learn to notice and interpret Black students' brilliance inside of instruction.

In this study, I conduct a single-case analysis of a short-term practice-based professional development program aimed at supporting teachers to identify Black students' strengths and to notice their mathematical thinking. I draw on video records, educator interviews, and digital logs to investigate how the practice-based professional development facilitators used the structures of a prebrief session, live instruction, and debrief session to create opportunities for participating educators to learn while foregrounding race as integral to the work of teaching. I also consider the extent to which the identified opportunities to learn were taken up by five educators who attended the practice-based professional development.

I use Critical Race Theory to situate Black children's marginalizing experiences in school within historical racial narratives rooted in white supremacy. I combine this perspective with theoretical frames for instruction (i.e., the "instructional triangle") and for "opportunity to learn" to interrogate what professional learning content was made available to educators, how the practice-based professional development facilitators made that content available, and how participating educators made sense of that content. Analysis of data revealed that facilitators used concrete activities to *layer* work on disrupting patterns of racism in schools with work on

mathematical content and work on aspects of teaching practice. I also found that participants used opportunities to learn in order to create a narrative of transformations to describe students across the week.

This study has important implications for in-service teacher professional learning, especially that which claims to promote equity and justice in teaching. Professional development must cultivate teachers' capacity to observe and interpret instruction in ways that acknowledge Black students' worth, goodness, and capability. It must explicitly disrupt the dominant racialized narratives that persist in schools and in the broader society. Without specific and meaningful attention to Black children's brilliance, and concrete efforts to confront these harmful narratives, educators and normalized education practice will continue to marginalize Black students in school by way of inequitable instruction, disproportionate and harsh punishment, and lack of exposure to high quality content.

Chapter 1
Introduction

To be loved but not known is comforting but superficial. To be known and not loved is our greatest fear. But to be fully known and truly loved is what it means to be loved by God. It is what we need more than anything. It liberates us from pretense, humbles us out of our self-righteousness, and fortifies us for any difficulty life can throw at us. (Timothy Keller, 2011)

Brilliant and Black. The ability to name people, places and things has historically been a sign of power. Culturally, naming carries a great deal of significance for how people see themselves and how others see them. For example, the ways that Black Americans have been named over the years in the United States has shifted. After stripping identities away from Black Africans, White Europeans dubbed them "colored." Shifting political relationships have forced different names and labels to come as Black people have gained some power. Since the term colored was coined, names have included "Negro" (late nineteenth century – 1960), which was then renamed to "Black" (mid-1960's – 1988) (Smith, 1992). Then, in 1988, Jesse Jackson urged the community to shift away from the accepted term of Black to African American. Jackson advocated for the term African American at the National Black Agenda convening that year because, in his words, "to be called African American has cultural integrity, it puts us in proper historical context." (Martin, 1991, p. 83). The purpose of naming is shifting the relationship that

an individual or group has to others and maybe even themselves by putting them in proper context. We say, "I want to be referred to as *this* because I want to be treated as *this*."

The notion of naming and renaming has deep cultural roots. For example, there are many instances in the Bible where people were renamed by God. Some of the more significant instances of renaming include:

- Abram and Sarai → Abraham and Sarah. Abraham in Hebrew means father of many nations. He and Sarah were given new names that represented their future roles. At the time that they were given their new names Sarah was 90 years old and barren. As a couple, they went from not being able to have children to becoming the father and mother of many nations (Genesis 17).
- Jacob → Israel. Israel in Hebrew means to contend. In this case Jacob was known as being a deceiver for stealing his brother's birthright. However, after he wrestled with the angel, he was renamed and became a devout leader (Genesis 32:8, 35:9).
- Saul → Paul. Saul was feared by many because he had both authority and a reputation for dragging women and men out of their homes to prison for following Jesus. After a series of events, Saul changed his path and became a Christian. His new name Paul represented a shift in putting away old ways of being and a radical change in purpose. He went on to become one of the most influential Christians in the Bible, authoring many of the New Testament books (Acts 9, 13:9).

In each of these biblical cases, individuals were given new names to mark important shifts in their roles and how others interacted with them. They each began to grow into what their new

names represented, and they stepped into new roles that tapped into the potential that had been lying dormant inside of them. In each case, God saw something in them that changed the way they saw themselves and how others around them perceived them. In each case above, the power of renaming changed these individuals' destinies.

Teachers are not God. But how teachers name and rename children has the power to shape the educational opportunities and experiences available to those children. Names represent the vision teachers have for children's futures and the vision they are able to help children cultivate for themselves. The names and labels teachers assign affect how they interact with children and how other people interact with them. For Black children, who have been historically marginalized, harmed, and excluded by a white supremacist ideology that names them intellectually deficient, lazy, and ineducable (Darby & Rury, 2018), teachers power to name and rename has enormous consequences for the quality of education they will have access to. Intentionally changing and naming Black children as brilliant signals that you see them as intelligent and worthy.

Names project. They communicate hopes, desires, and beliefs about potential. This study is about naming Black children as brilliant and, in doing so, naming the goodness and potential that lies at the core of each Black child. In the very same way that renaming set Abram, Sarai, Jacob, and Saul on very different paths, teachers naming the brilliance that Black students already possess has the power to reshape their educational journeys in profound and lasting ways.

Background

The idea for this research study began a few weeks before my PhD program started when I was invited to attend a professional development (PD) for elementary mathematics teachers

called the Elementary Mathematics Laboratory (EML). The EML had been going on for a few days before I arrived, and I agreed to attend without any framing of what it was about or its purpose.

The first day I arrived, I was handed a stack of papers and told to have a seat. The room was already filled with PD participants, and their conversations created a light buzz throughout the room. The facilitators came in and welcomed the group and began talking about the mathematics in the packet I had been handed. Apparently, this is what the children would be working on today. Once the facilitators were done talking, I packed up my things and followed the other teachers to a nearby room, still feeling confused about what this PD was about and what was about to happen. As I walked into the room, I immediately noticed that it was set up to mimic a real classroom with the empty desks set up in a U-shape. I also noticed two cameramen, a sound person, and empty chairs on risers in the back of the room. I remember thinking, "This is cute; they have it set up like a real classroom." After several minutes, I heard a bustling of noise, and 30 little boys and girls came running into the room. I immediately understood what was about to happen, and I got excited. I was about to watch a real teacher teach real students. Without seeing anything yet, I already knew that I was about to participate in a PD like none other I had ever been to before.

For the next two hours, I watched a White teacher teach a class of mostly Black children mathematics. Most of my thoughts for those two hours were out of curiosity. The kids[1] were funny, bubbling over with personality. How was the teacher able to keep a straight face? Where did these kids come from? How did they learn how to have such sophisticated discussions about mathematics so young? It was my first time seeing elementary kids going to the board and

[1] Children will be referred to as "kids" for the duration of the introduction because I wrote this from my teacher voice.

explaining their thinking while their peers asked clarifying questions or asked the student at the board to explain their thinking again. For me, this back and forth dialogue between the kids about mathematics without the teacher's probing was exciting.

When the live teaching ended, I was amazed. I also could not stop thinking about how this type of PD would have been great to get while I was still teaching. A short time later, all of the PD participants met together for a debrief with the teacher and facilitator. They discussed what we had just observed in the class. As I sat quietly observing the discussion, I could not help but notice that 90% of the PD participants were White, the facilitator was White, and the camera and sound people were White. The only other Black people I saw were the lady who took my name at the registration desk and the adult aid for the children who escorted them back and forth to the classroom. For the first time in my professional career, I was in a white space,[2] looking at Black kids learn mathematics, and I was still trying to process all of it.

My attention shifted to the environment in which the PD was taking place. My excitement for what I had seen during the class quickly turned into concern for the kids, and my instinct to protect them from any potential harm kicked in. As I listened to the discussion, I realized that the other participants and I were not seeing these kids and their thinking in the same way. In some instances, some of the observers named things that were invisible to me (e.g., pedagogical moves), and I remember thinking, "She is super insightful, I missed that evidence of student thinking." Then, there were times when participants would name things about the children that as a Black teacher who had experience teaching Black students, I would not have thought were such a big deal. In particular, they were naming things that reinforced negative perceptions of Black students (e.g., comments on student behavior). I remember thinking, "She

[2] I previously worked in schools with majority Black teaching staff. I don't recall any professional experiences prior to this where I was in a white space with hardly any other educators of color.

must not be used to working with Black boys because that way of acting or talking is normal." But then I thought, "Is she used to working with Black boys, and is this how she positions them?" These thoughts made me think about how the ways we see and name students can either reinforce or disrupt negative narratives of Black children. My first experience at the EML left me wondering if the PD was changing participants' ideas about what Black students are capable of doing, or, unintentionally, reaffirming racialized narratives about Black students.

My Positionality

My innate concern for the way that the EML students were positioned stemmed from my specialized knowledge of Black children's experiences, which in turn originated from my experiences as a Black child (see Figure 1-1) and as a teacher of Black children. In this section, I unpack my positionality and discuss how it shapes my work on this dissertation study.

Figure 1-1

My Sixth-Grade Picture

Black Girlhood in the South

In 1979, 25 years after the United States Supreme Court's landmark ruling in *Brown v. Board of Education*, Federal Judge Frank McFadden mandated Tuscaloosa City School system, located in a small town in West Alabama, must integrate their schools, declaring the "absence of integration equals the presence of segregation." A short five years later, I entered the Tuscaloosa City School System as a kindergartener. My parents, being the first in their families to obtain

professional degrees, sent me off to school knowing my colors and shapes, how to count, how to read, and, by their standards, "smart." As importantly, they sent me to school as a Black girl. Remnants of segregated schooling were all around us in our little town, but the ones that led to my interest in this research study are the ones that resulted from the disconnect I experienced between the constant abuse to my academic and mathematical identity I received at school, and my internal sensibility that I was someone who belonged in courses for "advanced" students.

For instance, I remember during elementary and middle school I was placed in the gifted program with one other Black girl. I later lost her as an ally when she was expelled in the ninth grade due to zero-tolerance policies. For the remainder of my high school years I was the only Black girl in the majority of my courses.[3] Was this because the other Black girls in my school were not capable or "smart" enough? I think not. I think instead that this was a direct result of systemic racism that seeped into the classroom through teachers' ability—or inability—to name Black students' as capable. For most of my teachers, I believe it was their lack of experience with and low expectations of Black children that influenced how they interacted with me, with us. My teachers were passive towards my capability, towards me. It is important for me to say that the majority of my teachers were nice, lovely White women. But it never failed that while I was in their mathematics classes I always felt invisible and like an impostor.

Shifting Into My Potential

My mathematical identity began to recover while attending a historically Black college where I majored in mathematics education. It was not until I was in an environment with instructors who valued my Blackness and supported my mathematical identity that I learned what my potential really was. I was no longer invisible, nor was I a victim of low expectations.

[3] There were 551 students in my graduating class.

They saw me. What was different? In this context, Black culture, identity, and capabilities were celebrated and embraced, and my professors' teaching practices reflected their high expectations of my peers and myself. This experience played a crucial role in my desire to be a teacher and advocate for students of color in mathematics classrooms.

Shifting Into My Purpose

As a secondary mathematics teacher for over a decade, working alongside a predominantly Black teaching staff, where the students were 100% Black and Brown, I can affirm that my students still had racialized experiences in mathematics class. My students were entangled in the racial narrative within our country of who can do mathematics and who cannot. They always tried to convince me that it was okay if they did not do well in mathematics because they were not White or Asian.[4] After years of hearing this falsity, it became my personal mission to fight against the dominant storyline about Black children's capabilities in mathematics.

While teaching high school mathematics there were two things I knew for sure: (1) From my own college experiences and my travels around the world I knew that there were large communities of Black individuals who were excelling in mathematics; and (2) I knew all too well how my students felt, and I wanted to intervene on that despairing narrative. Experiencing the effects of racialized narratives as both a student of mathematics and a teacher of mathematics, continue to be a driving force as I develop my scholarly identity as a social justice advocate and a mathematics education researcher.

[4] Racism shows up in a different way for so-called "model minorities." They are positioned as automatically good in mathematics and the sciences. While it appears to be a good thing on the surface, it is also a truly complicated position for students from these groups who do not fit into those stereotypical molds. I recognize that racism is manifested differently for them. However, what is most salient in this study is that their intellect is not automatically questioned in mathematics classes in the way that teachers question the intellect of Black students.

Experiences as a Researcher

Now, as a Black teacher educator and researcher, my research interests stem directly from these personal and professional experiences. In everything I do, I continue to work against students' internalization of low expectations. Although with each new role I take, the work is slightly different and the reach of my influence changes, a few things have always held constant for me and will continue to in the future. First, I know that all Black children are brilliant, and they deserve to be seen as brilliant by adults and peers. However, I also know that the persistent racist and classist narratives these children encounter about who can do mathematics are real, and these experiences have damaging effects. I am also convinced that teaching is powerful and that it can either perpetuate or disrupt racism and inequities in mathematics. Therefore, access to proper mathematics instruction is critical for children who are from marginalized communities. I am committed to understanding what comprises that sort of teaching practice and to make it the norm rather than the exception. Since most of my teaching experience is with Black students, I have chosen to begin my research agenda with these students, hopeful that what I learn from this study and future studies like it can be applied across other marginalized communities in our country.

Of the many aspects of my identity that shape and inform my research, most important are the intersections of my identities as a Christian, a Black woman, and a mathematics teacher. These dimensions of who I am enable me to understand and be compassionate toward children who are subject to systemic oppression and abuse, and toward teachers who are learning to change their ways of thinking and acting. These dimensions enable me to identify and codify the work of mathematics teaching that can explicitly disrupt inequities. These aspects of who I am also enable me to ground the work that I do—with children and teachers—in hope for their

future selves and in love for current positions and spaces. Finally, they enable me to see the research that I am undertaking as a way to serve my community.

The Study

In this study, I investigate a practice-based professional development program that was designed to influence the way participants constructed Black children's identities and abilities in elementary mathematics classrooms. Practice-based professional development (PBPD), in which teachers observe and work on teaching practice, provides them with a valuable opportunity to see, unpack, and develop their approaches to the work of teaching. However, I argue in cases in which the children involved are children of color, educators' racial narratives actively intervene, influence, and dominate what they see despite professed commitments to teaching all children. I also argue that closer examination of this phenomenon of how teachers name these children (i.e., how they view them through the lens of their racial narratives) is critical to understanding whether and how this pattern can be interrupted.

The study is situated in a special summer school classroom, which is simultaneously also the context for an intensive one-week long professional development. The purposes of this study are (a) to identify the opportunities to learn in a short-term PBPD that foreground students' race and identity as part of the work of teaching and (b) to consider the extent to which the identified opportunities to learn were taken up in the ways a sample of educators attended to, interpreted, and constructed Black children's experiences in the classroom.

Naming and Seeing Brilliance

Considering the complex interplay of identity and perception in children's learning, I take as axiomatic that Black children are brilliant and that it is essential to name and see them that way. By seeing Black children as "brilliant," I am not only referring merely to their academic

performance. Naming Black children's brilliance is, first and foremost, about recognizing their humanity and ensuring that it is visible to the extent that each Black child's humanity is fully seen and recognized by their teacher and classmates. When Black children's humanity is visible to teachers, they facilitate their classrooms in ways that empower Black children to voice their thoughts, that ensure Black children are heard by the teacher and their classmates, and that foster Black children's agency to control how they as individuals and their ideas are perceived and represented (Settles et al., 2019).

Naming Black children's brilliance also means that teachers acknowledge Black children's infinite capacity to learn. To recognize that Black children have infinite capacity to learn means neither implicitly nor explicitly requiring them to prove their capacities before teaching them.

Lastly, naming Black children's brilliance means that teachers bring this orientation to every facet of their work, their choices, and their interactions with Black children. Teachers who do so recognize that each Black child will have important intellectual contributions to make, that they are inherently good and worthy, and that they are deserving of quality instruction and relationships with teachers that stem from love. This love must be rooted in teachers' fundamental commitment to recognizing and naming Black children as brilliant; it should not shift based on children's behavior or other outside factors. Inside of a mathematics classroom, seeing and acting on Black children's brilliance entails both a significant level of mathematical knowledge for teaching and critical awareness of the kinds of experiences that Black children are likely to have had, are currently having, and will have in schools.

We know that teachers perceive children differently based on children's identities. There is overwhelming evidence that suggests that children who come from marginalized backgrounds

are rarely seen as brilliant, and neither are they typically perceived as capable (Bullock, Gholson, & Alexander, 2012; Leonard & Martin, 2013). There is evidence of this in patterns of teacher-student interactions as well as in how these students are engaged in the educational experiences that they have in school. For instance, evidence indicates an alarming number of recommendations for special education, lower placement in ability groupings and tracking, retention rates, and recommendations for ELL programs (Burkam et al., 2007; Entwisle, 1997; Farkas, 2003, p. 1987; Hallinan, 1992; Mickelson, 2003). Teachers' negative perceptions of marginalized children are also evident in the high number of disciplinary actions taken against these children that remove them from the learning experience that they need and deserve. These limiting perceptions shape school and district policies that have adverse outcomes for non-White and non-Asian students (Morris, 2005; Noguera, 2003; Torres & Callahan, 2007).

Negative perceptions of marginalized children too often produce recommendations and placements that create circumstances for students that do not result in positive educational experiences. It has also been reported that many of these teachers' perceptions are inaccurate and lead to unnecessary outcomes (Farkas, 2003, p. 1987). Teacher bias is a "systematic under or overestimation of a child's ability, that is associated with children's sociodemographic characteristics" (Ready & Wright, 2011, p. 339). This problem is more than some individuals being racist or classist. Instead, it is embedded in a broader set of racialized and classist structures in this country—schooling and teacher education, just to name two. Teachers are part of that system, and teachers' patterns of seeing and naming children often reflect those larger patterns of racism.

However, it does not have to be this way. This study is premised on the idea that teachers have the power to name their Black students' brilliance and, in so doing, have the power to

intervene on inequities in schools through their ability to see, hear, and appreciate Black students' thinking. This is because when teachers can see, hear, and appreciate Black students' thinking, they can leverage this brilliance to grow the mathematical understanding of the entire class. In this dissertation I specifically consider how practice-based professional development can be designed and enacted to intervene in ways that promote participants' ability to see the brilliance of Black children in mathematics classes? I investigate this problem space with two research questions:

1. What opportunities to learn were offered in the practice-based professional development structures surrounding "live instruction" to support participants to see the brilliance of Black children's mathematical thinking in practice?
2. What patterns exist in the way that participants took up opportunities to notice and interpret Black children and the work of teaching in real time?

Organization of the Dissertation

This dissertation is organized into seven chapters. This chapter introduces the power of names that is embedded in both being able to give and receive a name, provides a background to the study, presents my positionality as the researcher, and frames the research problem. Chapter 2 describes the conceptual and theoretical perspectives that inform the study design and analysis. Chapter 3 presents a review of literature that is relevant to this study. Chapter 4 describes the methods, data sources, and analysis used in this study. In chapter 5, I present the opportunities for learning that were available in the prebrief and debrief structures surrounding live instruction in the practice-based professional development I studied. In Chapter 6, I present how five participants took up those opportunities to learn. I conclude the dissertation with Chapter 7 in

which I present an analysis that looks across both findings chapters, discuss implications of the study, and consider directions for future research.

Chapter 2
Literature Review

"*What is power? It is the ability to tell people what the problem is, who is responsible and what should be done about it. That's what power is*." – Kevin Phillips

Think with me what it might mean if on the first day of school, every Black child who walks into a mathematics classroom is seen, and feels seen, as brilliant. What if, in particular, they were treated as intelligent and worthy? What might that classroom look like? What might those children be doing? I imagine walking into such a classroom and seeing students who were co-constructing mathematics with their teacher. I would see students who were not afraid to contribute their ideas to the class. Students would be bold and uninhibited. I would look around the room and see a classroom environment that reflected who they were and their talents. I would hear students engaging in discussions in which they use mathematics to analyze the world around them and disrupt injustices. I imagine that their teachers would expect them to succeed, and their acts of resiliency would be the norm. I would hear teachers affirming students as sense makers. I would see teachers attending to identity and power.

Sadly, that is not the reality for most Black children in U.S. schools. Instead, they are confronted daily with the realities of the systemic racism that permeates our society and our history. In this dissertation, I underscore power in practice. I take the position that inside of schools, teachers are powerful agents in the lives of Black children who can either perpetuate or

disrupt the systemic racism that shapes those children's educational opportunities and experiences. Having the choice to do either is what power looks like for teachers. The status quo in mathematics classrooms is that Black students do not possess the means or skills to be talented in mathematics. Nor do they have the ability to acquire or apply mathematics. The narrative is that Black students will likely not aspire to be employed in jobs that require the rigor of mathematics, therefore it is the norm for them to receive instruction and opportunities that reflect these narratives. In this chapter, I unpack the context of Whiteness and systemic racism in which mathematics schooling and teaching are situated. I also consider how systemic whiteness shapes the continued development of teachers and explore ways to intervene on its presence in professional development spaces.

Reality of Racism and Racial Power

American racialization and hegemonic discourses have historical footings that date back as least as far as slavery. Slavery represents a clear embodiment of power wielded over Black individuals, who were brought into this country by White people as a workforce dedicated to the sole purpose of advancing White people's economic prosperity in the industries of tobacco and cotton production (Baptist, 2014). It was during the 17th and 18th centuries that the “White race” and what it meant to be categorized as “White” became synonymous with what it meant to be American. Bounding citizenship rights with assumptions about one’s biological and cultural makeup introduced an intersection of power and race within this country that activated racial superiority in favor of Whites (Lewis, 2004).

Whiteness, an ideology that has been formed and implemented over time through a series of structures, “maintains White supremacy, valuing one racial group over others, which produces White privilege Leonardo, 2004, Picower, 2009” (Battey & Leyva, 2016, p. 50). American

institutions such as housing, media, criminal justice, jobs, finance, health, and education work together to standardize and legitimize racialized practices and perpetuate White supremacy. For example, it has been well documented that media, an influential structure within our society, has participated in a concerted effort to link such attributes as "violent," "dangerous," "lazy," and "over-sexualized" to Blacks and Latinx people, while overrepresenting Whites as victims, high-achieving, dominant, and normal (Bonilla-Silva & Ray, 2009; Dixon & Linz, 2000; Entman & Rojecki, 2000; Harris-Perry, 2011; Saperstein & Penner, 2012). The resulting normalization of the racist practice of misrepresenting whole groups of people have negatively shaped the success narratives of Black children in schools and support a cultural bias against Black children in schools (Bartell et al., 2013; Ladson-Billings, 1994).

One place that normalized racist practices of schools can be found is in educational policy trends. Voluntary school desegregation plans are policies that result in corralling Black students into public schools. High-stakes tests policies result in disproportional rates of Black students not passing tests, having to repeat grades, and not qualifying for graduation. At the same time, zero-tolerance policy approaches to school discipline disproportionately increase the number of days Black students spend out of class in comparison to White students (Wald & Losen, 2003). Noguera stated that "an examination of which students are most likely to be suspended, expelled or removed from the classroom for punishment, reveals that minorities (primarily Black and Latinos) are vastly overrepresented (Noguera, 2003, p. 341).

Many people think that these policies are primarily associated with drugs, guns, and violence. However, they are most often associated with non-serious offenses (Heitzeg, 2009). In its 2017 report, the Power U Center for Social change reported that "Zero-tolerance policies and police presence in school have been the primary way Miami-Dade County Public schools

attempt to deter crime and create environments that the school administration considers safe" (*Miami Dade County Public Schools: The Hidden Truth*, 2017). They also provided examples of what the zero-tolerance policy looks like in real cases:

> A 17-year-old girl by the name of Charlene recounts being locked out when the school automatically locks the entry way doors when the bell rings, signaling the beginning of a period:
>
> > You could be walking to class and the bell rings the teacher tells you mm-mmm, lockout. Charlene mimics the finger-wagging motion of a teacher. You're there, and you cannot get inside. Even if you have a pass from the teacher saying you could go. You cannot get inside. They send you to lockout. In lockout, you basically sit down in a classroom the whole time that you're supposed to be in class, and you don't really do anything at all. Total waste of time. Total waste of education. (*Miami Dade County Public Schools: The Hidden Truth*, 2017, p. 19)
>
> Jonathan, a 17-year-old student at Miami Edison Senior High School, described his suspension experience:
>
> > Last year, I was suspended out-of-school for two days for talking back to my teacher. I came in the classroom with my phone out and he was like 'Put it away.' I said, 'Why are you telling me to put it away today when you never have a problem with it before? My vice-principal told me that I was suspended for two days. (*Miami Dade County Public Schools: The Hidden Truth*, 2017, p. 6)

Zero-tolerance policies, in theory, are supposed to deter students from misbehaving in school. But in reality, they are more often used to target students who commit minor infractions that result in harsh punishments that impede their right to be in class and learn (Heitzeg, 2009).

Taking systemic Whiteness as a premise of this study allows me to unpack the entrenched racial narratives, institutional structures, and racist traumas that define Black students' educational experiences. More importantly, it opens up space to investigate the ways that teachers operate as agents of Whiteness in mathematics education practices. Acknowledging that Black students' experiences in schools are traumatic links directly to my notion that both teachers' instruction and the way children are viewed by teachers are extensions of systemic Whiteness. What would it take for teachers to be disruptive, rather than reproductive, agents in and through practice? This question presses us to worry about how teachers are developed and in what ways that development can work towards disrupting structural racism from inside of the classroom.

Education

The consequences of Whiteness as an ideology have been studied for almost 30 years across many disciplines including history, sociology, legal theory, literature, women's studies, and education (Hartmann et al., 2009). In education, policies and laws related to school segregation have reproduced violence toward racial minorities and continue to do so today. Among these policies are California Proposition 227, which instituted English as the exclusive legitimate school language and implemented tracking practices that group children in ways that limit educational opportunities (Leonardo, 2004). Consequences of systemic Whiteness for Black children are not only visible at the top level in educational policy but can also be seen in practices inside classrooms. Evidence of this includes an alarming number of recommendations for special education and English language learner programs, lower placement in ability groupings and tracking, retention rates, and teachers' hypersensitivity to these students' behavior

(Burkam et al., 2007; Entwisle, 1997; Farkas, 2003; Hallinan, 1992; Mickelson, 2003; Skiba et al., 2011).

Mathematics Education

This dissertation focuses particularly inside the teaching and learning of mathematics. In mathematics, Whiteness has a long history of shaping the discipline to exclude people of color (Battey, 2013; D. B. Martin, 2013; Stinson, 2008). For example, Battey & Leyva (2016) argue:

> What all of this means within mathematics education is that an ideology of Whiteness operates to devalue, oppress, and discriminate those perceived as "less" or not White. In conjunction with this devaluing, the ideology maintains Whites in an objective and neutral position of power to divvy up access. An ideology of Whiteness would then serve to position White people, White ideas, and White behaviors as more valued institutionally and in classrooms, which may not always be visible in terms of curriculum designers and policy developers. Moreover, Whiteness oppresses blackness through deficit ideas, poor treatment, and lower quality of instruction. The creation of a racial ideology of Whiteness then brings with it very real consequences. (Battey & Leyva, 2016, p. 55).

In their Whiteness framework in mathematics education, Battey & Leyva (2016) suggest that Whiteness shows up in at least three different ways: in identity, in labor, and institutionally. For example, they point to the many ways that Whiteness is reproduced through institutional discourse and the physicality of space, while also examining how power is distributed through historical evidence of exclusion and organizational logic. Concerning labor, they argue that cognitive ability and behavior are managed by the teacher and that emotions are regulated by the students. Concerning identity, they focus on ways in which Whiteness excludes racial minority

groups from being considered legitimate within mathematics spaces, co-constructs students' identities, and impacts students' ability to develop agency and resist.

Teacher Education

This study is also a study of teaching and teacher education. Systemic Whiteness and racism are deeply embedded in teacher education (Sleeter, 2017). Teacher education perpetuates whiteness and recruits individuals who, for many reasons, are invested in perpetuating whiteness (Sleeter, 2016). Teacher candidates are, by and large, White, and they have grown up and been successful in a system of whiteness (Sleeter, 2017). The residuals of this concentrated force of systemic whiteness recruitment show up in teacher education in a variety of ways, such as consciously or unconsciously evading whiteness as power (Gadd, 2020; Haviland, 2008) (Haviland, 2008) and in techniques and pedagogical strategies that stem from a desire to maintain power through a myth of meritocracy (Frankenberg, 1993; H. Richard Milner, 2010) and colorblindness (Cobb, 2017; Lewis, 2004; Ullucci & Battey, 2011).

Additionally, several scholars have documented how the presence of whiteness in teacher education programs works to silence the voices of teacher candidates of color (Burant, 1999; Guyton et al., 1996; Watts Pailliotet, 1997). This may be why in alternative teacher certification programs, there seems to be a growing trend of non-White individuals choosing this as a path into teaching. For example, according to a publication by the National Center for Education in 2011, more than 53% of Hispanic teacher educators were choosing alternative certification programs (Feistritzer et al., 2011). In efforts to disrupt whiteness in teacher education, many alternative certification programs have specifically designed their programs to capitalize on the wealth of knowledge and experiences that their non-White teacher candidates bring with them as resources to their program. These alternative certification programs have developed curricula to

meet the needs of and value the experiences and identities of underrepresented teacher candidates (Sleeter, 2001).

Classroom Teachers

Classroom teachers, arguably the most influential actors inside of schools, are products of and participants in the larger system of whiteness. Simply because all teachers were born and grew up in this country, they inhabit properties of whiteness by default. Not only are teachers inhabitants of this system, but they are also carriers of the system. Significant evidence exists that teachers reproduce larger patterns of racism in their classroom—for example, in their interactions with children and families, in their teaching moves and strategies, in their curriculum choices, and even in their micro-interactions informed by the ways in which they view children.

How teachers view children predominantly reflects larger patterns of racism that exist within the more extensive social system (Vaught & Castagno, 2008). For example, research suggests that broader societal factors like socioeconomic status (SES) affect teachers' perceptions about their students' capabilities (Rist, 1970). Teachers' perceptions of children play out in the organizational structures of classrooms and are ultimately made visible in the "variations in the experience of success or failure, praise or ridicule, freedom or control, creativity or docility, [and] comprehension or mystification" (Rist, 1970, p. 412) that students experience based on their SES or the color of their skin. This is because the larger system of whiteness and its oppression of Black children in school is embodied and carried out through the discretionary actions (Ball, 2018; Lipsky, 1980) of individual teachers who are both products and perpetuators of a racist system. I am not claiming that teachers intentionally reproduce racism; but I am claiming that just by growing up in this racist system, even under the influence of the power of being good and doing good, teachers' practices can be oppressive.

In the same way that teachers' individual actions have the power to reproduce racism, they also can be exerted to disrupt racism and whiteness. Individual teachers have the power and access to effect change and intervene on inequities simply because they are the single greatest factor in student learning inside of school. An example of this can be seen when a teacher decides within discretionary spaces how to interpret and respond to what children know and can do (Ball, 2018). A teacher who does not have an orientation that is rooted in the idea of Black children's brilliance might engage students in small group work while at the same time upholding status and power dynamics. Langer-Osuna (2016) analyzed the way that a Black boy was publicly positioned as less competent by his teacher, which was then mirrored in the ways that his peer proceeded to treat him as less competent during partner work in a mathematics classroom. Teachers can change how students experience school by becoming conscious that there are variations in the ways that Black students experience racism in school and that teachers themselves are often the ones who carry out these normalized racist practices in the ways they see, interpret, and respond to students.

While racist structures are larger than individual teachers, individual teachers still have the power to disrupt structural racism. Who a child's teacher is has a tremendous impact on their growth academically. This suggests that even within the normalized practices of racism in schools, individual teachers can effect change. Teaching can interrupt racism. Imagine changing the ways that individual teachers exercise their agency. Although it may seem small, shifting the ways that individual teachers see particular students, multiplied out by the number of teachers we have and the number of students whose lives they touch, could be the beginning of real change.

Since teachers can work for or against justice, it is imperative to design professional development that can intervene on the inequities that students experience by focusing on how

teachers can be agents for disrupting the system of whiteness. It is on this critical possibility that this study focuses.

Professional Development

It is vital for practicing teachers to have ongoing opportunities to learn. Despite efforts to reform or improve pre-service teacher preparation (Ball & Forzani, 2009; Cochran-Smith et al., 2016), in-service teachers will always require support to continue learning throughout their careers. The fundamental question is, do professional development programs (PD) in which teachers engage help them to serve their actual students better? More specifically, what does the literature say about trying to help teachers to see, respond to, and teach children who have been marginalized?

There is increasing recognition that teaching is unnatural work and that relying on teaching experience alone for teacher professional learning is not sufficient to improve teaching at scale (Ball & Cohen, 1999). There is widespread agreement that meaningful opportunities for professional learning are a key component in building and maintaining expertise for the more than three-million K-12 teachers nationwide. Some reasons why teachers must continue learning include: teachers may change grade levels, they may have to teach new curriculum standards, they may move to a different school, or they may find themselves ready to be better and more skillful with their students. Whatever the reason, ongoing learning matters, and it is necessary to support teachers in many different areas within the profession at multiple stages of their careers.

In order to provide a conceptual backdrop for this study, I first describe two contemporary professional development trends in mathematics education that aim to improve quality of instruction while at the same time collectively working towards a goal of disrupting patterns of inequities in schools for Black children: (a) focusing on student thinking and (b)

focusing on the intersection of culture and schooling. I argue that each trend's attempt to foreground one component and background the other risks preserving whiteness. Then, I describe a different approach, practice-based professional development. While this is a potentially promising approach to disrupting inequities in a way that complements the first two trends, without a great deal of intentionality, it has the potential to be problematic as well. Finally, I present and argue for a set of design considerations for practice-based professional development that I hypothesize can aid in disrupting barriers that teachers experience when they find it difficult to see and value Black children doing mathematics.

Professional Development Focused on Student Thinking

One common trend used in mathematics professional development programs is to explicitly focus on students' mathematical thinking. An intentional focus on students' mathematical thinking engages teachers in the work of: continuing to develop their mathematical knowledge for teaching (Ball et al., 2008); exploring the mathematical resources that students bring to the work (Lave & Wenger, 1991; Taylor, 2012); moving away from deficit ideologies (Ford & Grantham, 2003; Gorski, 2011; Sleeter, 2004; Yosso, 2005); interpreting students' ideas through considerations of multiple solutions and the questions students are answering; and developing instructional trajectories (Kazemi & Franke, 2004).

The trend of focusing on student thinking was borne out of dissatisfaction with reports of the opportunity gaps experienced by Black children in mathematics instruction. These experiences include being taught mathematics as a series of disconnected concepts, having to learn mathematics vocabulary out of context, instruction that overly emphasizes procedures, and instruction that values answers over explanations (Anyon, 1981; Ladson-Billings, 1997). The strategies and techniques that teachers use to investigate students' mathematical thinking have

the potential to ultimately improve the quality of their instruction, which might then support them as agents to disrupt patterns of racism.

One of the seminal professional development programs within this trend is the Cognitively Guided Instruction (CGI) program (Carpenter et al., 1996). More than 20 years ago, CGI designers created a summer professional development program that used research-based ideas about student learning to increase teachers' knowledge of students' strategies in elementary mathematics. Over the years, the mathematical content addressed by CGI has included addition, subtraction, fractions, and early algebra (Carpenter et al., 1996, 2000; Carpenter & Fennema, 1992). One outcome of this work has been shifts in participants' perspectives of children and shifts in classroom practices that are more geared towards students' thinking. In other words, teachers learned to foreground student thinking.

CGI has inspired many other programs of professional development that have continued this same trend of focusing on increasing teachers' understanding of their students' mathematical thinking. Among these are the California Mathematics Professional Development Institutes (MDI) (Hill & Ball, 2004), Summer Math for Teachers (Simon & Schifter, 1991), Integrated Mathematics Assessment (IMA) (Saxe & Gearhart, 2001), Problem-Centered Mathematics Project (Cobb et al., 1991, 1992), professional noticing (Jacobs et al., 2010), Educational Leaders in Mathematics project (ELM) (Saxe & Gearhart, 2001), algebraic thinking and its relation to elementary mathematics concepts (Jacobs et al., 2007), and Count Me In Too program (Bobis et al., 2005).

Despite their success and professed commitments to children, given the broader sociopolitical ideologies in the U.S., these programs' approach of foregrounding students' mathematical thinking and connections to practice, as well as ongoing engagement and

collaborative inquiry, is also preserving whiteness. Mathematics education professional development has typically been inattentive to students who are not seen as legitimate members of the group that can do mathematics. In particular, Black children and girls are two groups who have typically been delegitimized as doers of mathematics (Secada, 1992). Many professional development programs focused on student thinking report conducting research in contexts with students who come from marginalized communities. However, when looked at deeply, issues such as race, class, language, or disability are not the focal points of the programs and are not made visible in the overarching goal of making learning accessible and inclusive "for all" (Abdal-Haqq et al., 1995; Little, 1993; Wilson & Berne, 1999).

One example is the Algebraic Thinking professional development program (Jacobs et al., 2007). In this PD, the authors noted that the students of the participants were 99% students of color and 52% English language learners. The school that students attended was one of the lowest-performing schools in the area. The aim of the PD was to focus teachers on students' thinking and on understanding students' approaches. The study also engaged teachers in some intentional work to focus on what the students were doing by way of counter-stories to interrupt deficit narratives. However, this was not an explicit focus of the PD; rather, it seemed to be a generic consideration employed to move teachers away from deficit discourse. If students' race, class, or culture had been used in the analysis, then more attention would have been placed on questions related to students' and teachers' identities. Studies that purposefully include students of color as the focal population should explicitly interrogate how students' minoritized identities intersect with their experiences as mathematics doers. In other words, who the children are and what they are doing should be more closely entangled.

Summary

Although the trend of focusing on student thinking has shown promise for improving teachers' mathematical content knowledge, little attention has been given to race and class. Designers of professional development programs within this trend have figured out ways to use a focus on students' mathematical thinking as a gateway to also work on improving teachers' instruction. Their logic is that a focus on improving teachers' instruction is valuable for all children, especially those who are susceptible to receiving poor instruction simply based on their race or class. This is because it is well-established that there are vast opportunity gaps for Black children and other children from minoritized groups. So, it is understandable that scholars see the effects of their student thinking PD programs as having implications for disrupting opportunity gaps and working against inequities in schools. However, by not incorporating race and class in their analyses of research studies of PD programs under this trend, these scholars are likely to engage in colorblindness, one of the three theoretical propositions of whiteness (Hartmann et al., 2009). In studies such as these, both content and practices are constructed according to normative ways of viewing mathematics and instruction, and systemic whiteness prevails.

Professional Development Focused on the Intersection of Culture and Schooling

A second PD trend explicitly focuses teachers' attention on seeing and appreciating Black students and leveraging the experiences and resources that these students have both inside and outside of school. This trend is about trying to improve the quality of teachers' instruction by foregrounding equity concerns and providing support for teachers to intersect culture and schooling in their instruction. This trend is rooted in a longstanding need to disrupt historical trauma that continues to plague Black students' educational experiences and opportunities even today. Black students' educational experiences and opportunities today continue to be affected by

a master narrative about them that nullifies their cultural capital and delegitimizes the idea that they can be successful in mathematics.

Professional development programs that fall into this second trend tend to focus on building skills, strategies, and mindsets that enable teachers to affirm students' identities as doers of mathematics and to incorporate students' cultures into instruction. Professional development programs within this trend are trying to address a very specific need by attending to the gaps that occur at the intersection of culture and schooling. Some examples of this include PDs focused on integrating ideas of multiculturalism and on exposing teachers to culturally relevant pedagogy and out of school practices and students' funds of knowledge (Chu & Rubel, 2010; Foote, 2009).

Culturally relevant pedagogy, a groundbreaking approach that originated out of observations of successful teachers of African American students, comprises three components: believing that all students have the capacity to learn, believing that culture influences learning, and believing that teaching is a political act (Ladson-Billings, 1995). Many mathematics education scholars have imagined and investigated what culturally relevant pedagogy would look like in mathematics classrooms serving students from marginalized communities, including what it would mean to prepare teachers to do this work with students who are culturally different from themselves (Aguirre & del Rosario Zavala, 2013; Averil et al., 2009; Brown et al., 2018; Civil & Khan, 2001; Gutstein et al., 1997; Lipka et al., 2005; Matthews, 2003; Tate, 1995; Ukpokodu, 2011; Young et al., 2017). In much of this literature, scholars are working to move the theory into practice agree that there are "synergies between the cognitive activities of mathematics and the nuanced cultural existence of students of color, which has provided valuable insight for understanding how to train mathematics teachers" (Brown et al., 2018, p. 5).

Cultural funds of knowledge, a theoretical and practical orientation that grows out of the field of anthropology, encompasses the belief that children bring a variety of resources with them into the school setting (Moll et al., 1992). Scholars in this tradition argue that the quality of teachers' classroom instruction would improve if teachers were to leverage and incorporate their students' historical and cultural knowledge, skills, and experiences. For instance, Carraher et al. (1985) and Saxe (1988) have investigated children's use of informal mathematics in authentic contexts (e.g., as street vendors in Brazil) and learned that children draw on sophisticated mathematical resources outside of school. These scholars noted many interesting mathematical strategies that children used in context to solve problems but also noted that these same children struggled to draw on those strategies to solve mathematical problems in formal school contexts (Nasir et al., 2012). In the early 2000s, research continued to evolve as mathematics education scholars, such as Norma González and Marta Civil, argued that content areas such as language arts and social studies were greatly impacted by teachers' incorporation of students' funds of knowledge, which spurred them to think more deeply about their ability to see and identify mathematical funds of knowledge within communities that could later be used to increase the quality of teachers' instruction in mathematics classrooms (e.g., (González et al., 2001). This later informed PD that was designed to specifically help teachers link skills and strategies that students use out of school with those used in school (Foote, 2009; Taylor, 2012).

Summary

The second trend focuses on building teachers' ability to recognize, value, and see who their students are, which also includes the communities in which they live. As I continue to think about the ways in which systemic whiteness shows up in our society, I cannot help but ask myself do I see the effects of whiteness lurking in the shadows of PD located within this trend. I

question in what ways does systemic whiteness impact both the design of this PD and the enactment of the skills and strategies promoted in the PD in practice.

As it pertains to the design and facilitation, designers of PD programs focused on children's funds of knowledge perpetuate whiteness by separating out issues of race from culture—that is, by overlooking the ways that children's cultural experiences are explicitly raced in the U.S. context. Moreover, emphasizing cultural contexts and relevance may lead teachers to deny children access to rigorous content. All of this can implicitly send a message that attending to issues around race is a bonus when, I argue, it should be the default.

I also worry that whiteness is also perpetuated when PD facilitators do not intentionally provide teachers with the mathematical knowledge for teaching necessary to support teachers' efforts to effectively affirm students when they do embed culture and identity into their instruction. Even when teachers have good intentions to see students for who they are and the communities to which they belong, they nonetheless need that mathematical knowledge. They need it to be able to design and construct learning opportunities for children, to hear and see their brilliance in real-time, and to respond in the moment to validate and honor the children's identities and capabilities.

As it pertains to enactments of skills and strategies, I first question teachers' eagerness to connect to Black children's communities on the basis of the presumption that Black children do not feel valued or are not motivated to learn. Such assumptions are dangerous in as much as they open up a set of concerns about one's interpretation of self-worth and motivation. This stream of logic also applies to other ways of observing and interpreting children, such as by focusing on their "participation" and "effort," which are likely to reinforce negative perceptions about Black children and their culture (I feel like you could cite Darby & Rury here). Thus, perversely,

teachers who are encouraged to take up a funds of knowledge approach to instruction without a robust understanding of the ways that race and culture intersect in the U.S. context may end up concluding that Black children are less successful in mathematics because they are not as interested in content and/or are unable to engage with more complex mathematical tasks.

Summary of Two Trends

My examination of each trend raises questions about the potential dangers of what is foregrounded by each and how they might be preserving whiteness. When one focuses on student thinking but neglects to provide teachers with a way to see the children as Black children, it potentially preserves whiteness by failing to equip and support teachers to see children as whole people. When the focus is on culturally relevant pedagogy and funds of knowledge, teaching teachers to see the brilliance in and value the experiences of Black children without equipping them with the mathematical insight to see and appreciate what Black children are saying about content can also preserve whiteness.

In both cases, these approaches may shortchange the opportunity to fully equip teachers with the resources needed to see and appreciate Black children's brilliance. This, in turn, shortchanges the quality of instruction that Black children receive. On one hand, it is meaningless to hear and interpret Black children's brilliance and not appreciate what it means for them to be Black children in a mathematics class and recognize what resources they bring to their mathematical ideas. On the other hand, teachers do not get enough mathematics to really disrupt--it is meaningless to see Black children as brilliant but not be able to hear and interpret their brilliance mathematically. Professional development programs that do not do enough to help teachers fully see and value children's thinking as Black children doing mathematics allow a critical gap to remain in teachers' understanding of their work.

Practice-Based Professional Development

A different way of thinking about the map of PD focuses directly neither on content and pedagogy nor directly on race and culture. Instead, it takes as its orientation a focus on connecting teachers' professional learning more closely to the work of teaching. In other words, it is "practice-based." Practice-based PD (PBPD), through its explicit focus on teacher learning around the actual tasks and work of teaching rather than on theories of teaching opens up the space to both attend to student thinking and embrace and recognize who children are (Ball & Cohen, 1999; Ball & Forzani, 2009). Learning in and from practice attempts to improve teachers' instruction through supporting the analysis of artifacts, such as students' work, or representations of teaching, such as classroom videos (Ball & Cohen, 1999; Borko et al., 2011; Fishman et al., 2017). Artifacts and representations of teaching are powerful tools that provide many opportunities to engage educators in collaborative learning. However, they are neither neutral nor colorblind providing PD facilitators with opportunities to foreground students' beliefs, cultures, and out of school practices within the context of rich mathematical environments.

Practice-based PD can be designed to highlight children's identities and experiences to be integrated with a close focus on mathematics. It offers an opportunity… but is not promised. For example, Borko et al. (2010) investigated two different practice-based professional development programs that used videos as representations of practice. In both cases, facilitators were able to use video to develop teachers content knowledge and pedagogical knowledge (Borko et al., 2011). However, neither the teachers' nor the students' identities are addressed in this study. Thus, the authors' analysis of instruction was void of context and color, which they present as neutral. But Classrooms are anything but neutral. By contrast, Jilk (2016) studied a PBPD that also instituted video analysis, and the author did provide demographic data for both their

teachers and students. Jilk centered students demographics inside of their objectives to "reculture" mathematics by disrupting deficit perspectives about students and empower teachers to focus on students' strengths. To take full advantage of practice-based professional development programs educative potential, facilitators must carefully design programs that intentionally zooms into the individual components and interactions of instruction while also zooming out to attend to the sociohistorical context.

Common language around the meaning of the term "practice" does not exist within education. Lampert (2010) identifies four commonly accepted conceptions of practice: (1) Practice as that which contrasts with theory, (2) teaching as a collection of practices, (3) practice for future performance, and (4) practice of teaching. My working definition of "practice" for the purposes of preparing in-service educators to do the work of teaching better while holding constant that Black students are brilliant is a combination of the first and fourth conception. From the first conception I adopt that "practice" is "what people do rather than what they think or know" (Lampert, 2010, p. 3). And from the second conception I take that "practice" is "adopting the identity of a teacher … and taking on the common values, language and tools of teaching" (Lampert, 2010, p. 10).

Further, the PD program in which my study is situated, the Elementary Mathematics Laboratory (EML), is centered on live instruction. This component of the EML reflects Jackson and Wilson's (2012) definition of practice: "a White teacher and Black students interact with one another and with the mathematics, and … those interactions support (or do not support) learners to participate in and/or identify with mathematical activity" (Jackson & Wilson, 2012, p. 362). In addition, the professional development program of the EML focuses on "practice" by engaging a

community of educators, using the common tool of live instruction, to analyze the work that teachers do while considering how race and identity are woven into every transaction.

There exists a broad consensus about the value of providing teachers opportunities to learn in and from practice because this approach gives teachers the chance to improve the quality of their instruction by learning things that are closer to their actual work, where they can actually use them (Ball & Cohen, 1999). Practice-based PD engages teachers in investigations of practice and opportunities to reflect on and share experiences as a learning community (Ball & Cohen, 1999; Fishman et al., 2017). Practice-based PD also gives teachers an opportunity to examine teaching and learning with artifacts that are common within their professional context (Ball & Cohen, 1999). Artifacts of practice provide context for teachers to ask questions, investigate, critique, and participate in professional dialogue—all desirable components of a practice-based professional development program (Ball & Cohen, 1999). Not only do artifacts provide rich learning opportunities for teachers, but they also allow teachers to begin to develop skills around professional noticing.

Continued education focused on practice is a promising approach to professional development because it has the potential to provide in-service educators access to development that is centered around student thinking and that takes Black students' experiences into consideration. More importantly, practice-based PD supports in-service educators in learning about the complexity that is embedded at the intersection of students' mathematical thinking and their experiences in schools. However, it is also important to stress here that it is at these intersections that whiteness may reproduces itself. The micro-interactions that occur when teachers engage with students and with content are spaces where their ability or inability to see and appreciate Black children's brilliance shapes whether they will disrupt or maintain whiteness'

power. Without careful design and consideration, educators can be distracted by the broader racial narratives that hover around and within these micro-interactions. For example, unless PD facilitators intentionally intervene, educators may make problematic assumptions about students' ability or level of engagement based off of "evidence" such as wearing hoodies or engaging in age appropriate behavior.

While there is literature on practice-based PD that does address some aspects of equity and justice in teacher professional learning it is limited. Professional noticing studies that fall into this category generally focus on disrupting deficit language, and noticing equitable instruction (Baldinger, 2017; Hand, 2012; Jilk, 2016; Van Es et al., 2017; Wager, 2014). My study adds to the literature on practice-based PD by analyzing considerations for 1) short-term PD, (2) embedding live instruction, and (3) focusing on Black children and using their brilliance as resources for instruction.

Observing From the Periphery

The primary design element of practice-based professional development is for educators to participate in practice. Research reveals the benefits of and ways to structure legitimate peripheral participation in teacher education as a tool for learning about practice (Lave & Wenger, 1991). However, given the goal of disrupting normative ways of seeing Black children in mathematics classes, is such peripheral participation risky? In teacher education programs, it has been widely agreed to give pre-service teachers experience as quickly as possible, but the field has learned that those opportunities are more fruitful when the focus of observations are structured. Otherwise, pre-service teachers tend to notice things that are not significant, or even notice things that perpetuate bias like concluding that certain students are lazy, their parents do

not care, or they are not as smart. Exposure to people who are different than you does not automatically change your view of them (Van Es & Sherin, 2002).

I argue that by keeping educators at the periphery of practice, we leave too much space for them to rewrite experiences that are designed to disrupt inequities and racism into narratives that reinforce or perpetuate inequities and racism. Teachers' implicit ideologies and decisions about teaching and learning, student voices, the potential of mathematical tasks, and the interconnectedness of them all are left wide open to be rewritten. More importantly, if our goal is to disrupt inequities in schools, then we must strive to challenge and structure teachers' attention and their interpretations in ways that specifically address inequity. Clearly, teachers must bring their own viewpoints to practice-based professional development, but more attention needs to be placed on how to structure what educators see and how they make sense of it in order to interrupt the tendency to repeat and reproduce the same racist narratives.

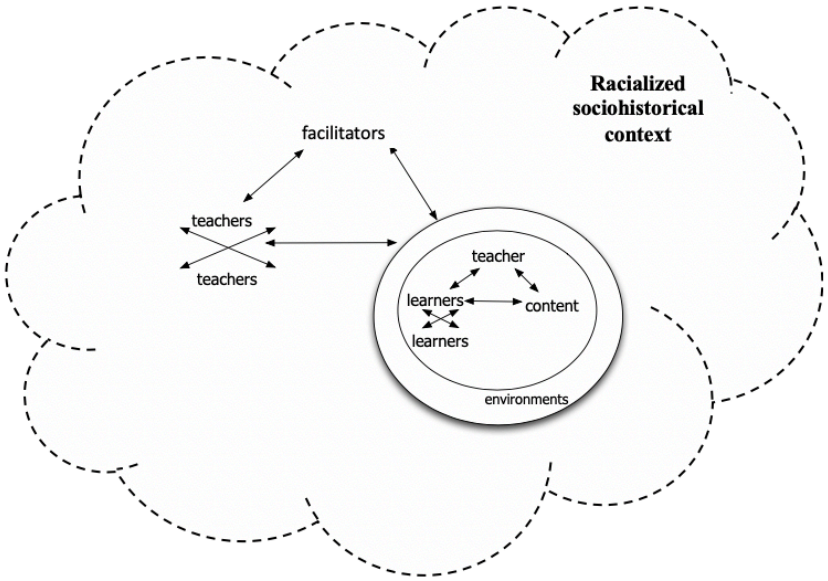
Given what we know about how educators perpetuate racial narratives in their interactions with children and in their teaching practice, how might PD designers and facilitators get them to stop rewriting racial narratives in the moment, when they are observing or interacting with a particular child of color? If we want to continue using practice-based professional development as a mechanism to challenge and disrupt inequities in mathematics education, then it is important to leave less space for educators to make up their own story.

Chapter 3
Conceptual Framework

This dissertation is a study of how a practice-based professional development (PBPD) program centered on a public teaching space, the EML, shaped a group of predominantly White educators' ability to notice and learn from the brilliance of Black children, rich mathematical content, and skillful teaching practice. In this chapter, I describe the theoretical framework that orients my study. I begin with the diagram in Figure 3-1 that illustrates the entire environment of my problem space. The diagram represents the teacher education instructional triangle (Nipper & Sztajin, 2008) which reflects relationships among PD facilitators, teachers, and PD content (i.e., K-12 classroom teaching; Cohen et al., 2003) that comprise practice-based professional development, as well as the sociohistorical environment in which PBPD is situated. As I argued in Chapter 2, the sociohistorical environment is racialized and shapes teaching and teacher professional learning via racial narratives that are foundational to ideas about who is teachable in mathematics instruction.

Figure 3-1

Practice-Based PD Instructional Triangle



Note. This figure was adapted from the classroom instructional triangle (Cohen et al., 2003) and the teacher education instructional triangle (Nipper & Sztajn, 2008).

In this chapter I describe the three theoretical lenses that shaped the ways I attended to and analyzed the PBPD setting of the EML: Critical Race Theory, professional noticing, and opportunity to learn. I begin by describing the most important of these, critical race theory. Critical race theory orients my entire view of the context described above in Figure 3-1.

Critical Race Theory

Black children and their instruction are situated inside of a long history of racism in which the educational system functions as a mechanism to oppress students from marginalized communities to preserve power and whiteness. As I recount in Chapter 1, during my first visit to the EML there came a point at which I became concerned for the fifth-grade students in the math

class. As a Black woman, the realities of racism and sexism are inescapable. When I was sitting there in that white space, observing and analyzing those Black children with those mostly White teachers, those inescapable realities jumped into the foreground, fueling my concern.

I use Critical Race Theory (CRT) to acknowledge the presence of racism and better understand how white supremacy continues to marginalize and plague Black children by way of their experiences in schools. Critical race theory acknowledges that "racism is endemic in U.S. society, deeply ingrained legally, culturally and even psychologically" (Tate, 1997, p. 234). This racial realism, in turn, seeps into the systemic structure of education and influences the ways that White teachers see Black children, interact with Black children, and choose curriculum for Black children.

The inception of Critical Race Theory dates back to the mid-1970s by legal scholars, most notably among them Derick Bell, Alan Freeman, Kimberlé Crenshaw, and Richard Delgado. Through an analysis of race and property, Gloria Ladson-Billings and Bill Tate began to use this framework to fill an under-theorized gap in education by exploring the intersections between racism and educational inequality (Ladson-Billings & Tate, 1995). Ladson-Billings (1998) further connected CRT and education by examining ways that curriculum, instruction, and assessment both individually and collectively maintain and encourage white supremacy. She argued that curriculum maintains white supremacy by controlling the master script of African Americans' authority and power, endorsing colorblind perspectives, and constraining which students have access to rigorous content. She asserts that dominant instructional strategies maintain white supremacy by operating off the premise that Black students are deficient and that they are solely responsible for their presumed deficiency. Lastly, she underscores that the

combination of both poor curriculum and ineffective instructional strategies culminate in poor performance on assessments, creating a self-fulfilling prophecy.

I use CRT as a historical lens that exposes the racial realism that Black students have experienced and continue to experience in schools and that jeopardizes their brilliance. It is especially important given the context of my study. The study focuses on a practice-based professional development program that took place at a predominantly white university campus and that engaged the predominantly White educator participants in observing and analyzing a class of predominantly Black children as they worked on challenging mathematics. Although professional development has not been the main object of scrutiny by critical race theorists, CRT is vital here to unpacking the PD design and educators' noticing about the children, content, and teaching practice they observed.

Not only are professional development programs situated in racialized sociohistorical contexts, common properties of professional developments are likely to reflect features of racism that the tenets of critical race theory identify. I highlight three tenets of CRT in particular as essential to the framework that I bring to critically interrogating the design and discourse of professional development programs. The first is *the permanence of racism*. The permanence of racism asserts that racism "is an inherent part of American civilization, privileging White individuals over people of color in most areas of life, including education" (Hiraldo, 2010, p. 55). Because White educators embody many U.S. cultural ideas, attitudes, and beliefs about Black students that flow from the history of anti-Black racism, many of their discriminatory practices are "influenced by unconscious racial motivations" (Lawrence, 1987, p. 322). These biases influence how educators interpret and attend to Black students. For example, educators may see Black children as lazy and lacking ability (Lawrence, 1987). In practice-based

professional development, a CRT perspective allows me to examine whether the impact that opportunities to study practice has on participants perpetuates or disrupts racial narratives that ultimately influence teaching practices (DeCuir & Dixson, 2004).

The second tenet of CRT that I foreground is *whiteness as property*. Whiteness as property "asserts that there are tangible aspects of life that White people claim as their own: hence, they are positioned to allow and deny access because of their claims to property" (Mensah & Jackson, 2018, p. 7). For instance, White people claim high-quality education for their children as property and control access to it through things like policy decisions that ensure White children's access to rich, rigorous curricula while denying similar access to children of color (Dreeben & Gamoran, 1986). Within a PBPD setting, CRT enables me to analyze in what, if any ways, facilitators' approach to programming upholds the white status quo and exclusivity of the white perspective (DeCuir & Dixson, 2004).

The third tenet I foreground, *interest convergence*, "stresses that racial equality and equity for people of color will be pursued and advanced when they converge with the interests, needs, expectations, and ideologies of Whites" (Milner, 2008, p. 2). In the case of the EML, White educators who attend often communicate that their interest is in learning about "ambitious mathematics instruction," although this term is not used by the staff in describing or advertising the program. According to Kazemi et al. (2009), ambitious mathematics instruction is instruction that "requires that teachers teach in response to what students do as they engage in problem solving performances, all while holding students accountable to learning goals that include procedural fluency, strategic competence, adaptive reasoning, and productive dispositions" (Kazemi et al., 2009, p. 12). "Ambitious mathematics instruction" is a color-blind perspective that does not specifically address the racialized identities and histories of the children, teaching,

and content involved. Even once educators figure out that the EML emphasizes disrupting patterns of inequity, it is plausible that they consider what they learn to be good for "all children" or "just good teaching" (Ladson-Billings, 1995). This would be a clear case of interest convergence because educators may see these teaching practices as having value not because they serve Black children but because they accommodate efforts to advance justice to the interests of "all" (i.e., White) children. If this is how educators interpret what they learn at the EML, then they may be less likely to take up the practices they are exposed to in ways that are specifically aimed at interrupting inequity. Foregrounding the tenet of interest convergence enables me to analyze whether and how educators take up opportunities to learn that prioritize the brilliance and the needs of Black students.

Given the contribution of CRT to my lens on the overall environment and actors in my study, I turn next to challenging dominant ideology (Solorzano et al., 2000) concerning Black students' brilliance by using CRT to interrogate features of instruction.

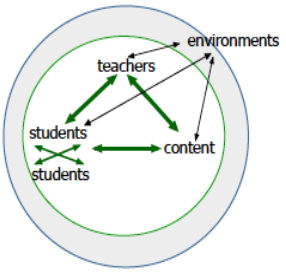
Applying CRT to Analysis of Instruction

In Chapter 1, I discussed how my excitement about the live instruction component of the EML's innovative approach to in-service teachers' continuing education. Instead of requiring educators to leave the classroom to attend a PD, the EML facilitators brought us to it. Live instruction was our common text and anchored the collective discourse. To best describe what we observed, I use Cohen, Raudenbush, and Ball's (2003) instructional triangle (see Figure 3-2). The instructional triangle, captures the interplay among the teacher, students, and content that occurs during instruction. Further, arguing that instruction does not occur in a vacuum, the authors situate the triangle within the broader environments of stakeholders, patterns, histories, and structures that permeate and shape teachers' work. This framework ushered in a wave of

research in mathematics education that allowed researchers to tease apart the components that make up instruction and to investigate the interactions among elements of instruction and the broader historical, political, and social environments.

Figure 3-2

Instructional Triangle



"Instructional triangle." Adapted from "Resources, Instruction, and Research," by D. K. Cohen, S. W. Raudenbush, and D. L. Ball, 2003, *Educational Evaluation and Policy Analysis*, *25*(2), pp. 124.

Stinson and Bullock (2012), describe the act of zooming in and out of the instructional system as a way to consider the phenomenon of Black students' brilliance in mathematics. In their description of shifts in mathematics education, they highlight that zooming in and out of the instructional system allows educational researchers to investigate the

> "dynamic complexities of how sociocultural and sociohistorical discourses have constructed and continuously shape students, teacher, and mathematics… and the complexities of the concentric contexts in which the instructional triangle is embedded." (Stinson & Bullock, 2012, p. 1164)

They suggest that this enables researchers/educators to push past investigating only the social interactions of instruction and to instead examine instruction from a much wider, critical-theoretical perspectives.

Before I walked into the EML, I was operating under the premise that Black students are brilliant both outside and inside of the classroom. A unique feature of the EML is that it offers

the chance to examine how different components of instruction can support and amplify students' brilliance inside of the classroom. It also challenges educators to consider the ways that Black children's brilliance can be used as a resource for instruction—as well as the ways it is routinely overlooked.

Cohen et al (2003) describe how systems, schools, and teachers coordinate various types of resources to produce instruction. Thus, Black students' brilliance is an important resource for themselves and their own development, as well as for their teachers. However, based on my own experiences as a Black child and a teacher of Black children, I've noticed that because teachers often fail to see Black students' brilliance, they do not coordinate it within their instruction. During my first visit to the EML, I realized that Black students' brilliance was in jeopardy if, at any point, the reality of their brilliance was in question and not in coordination with the other components of instruction. Therefore, an important element of my conceptual framework is to apply the three tenets of CRT discussed above to examine how Black children were positioned in the opportunities for educators' learning at the EML, and whether and how the educators perceived the Black children's brilliance within instruction.

I turn next to two key elements of my framework which focused my lens on participants' opportunities to learn and their uptake in the EML. I drew on two main constructs: professional noticing and opportunity to learn. I explain each of these in turn below.

Professional Noticing

The EML is a practice-based professional development (PBPD). Practice-based professional developments are distinct from other types of professional development programs because of their explicit focus on teacher learning around the actual tasks and work of teaching, rather than a focus on theories of teaching. PBPD opens up the space in teacher learning to both

focus on student thinking and embrace and recognize who children are (Ball & Cohen, 1999; Ball & Forzani, 2009). A more in-depth description of PBPD is found in the literature review (see Chapter 2. The EML, as a PBPD, expands the instructional triangle (Cohen et al., 2003) out one level so that the PD participants are now the "students," the PD facilitators are now the "teacher," and the live instruction becomes the "content." See the illustration of the PBPD instructional triangle above in Figure 3-1. I adapted the figure from Nipper and Sztajn (2008) to fit the actors of the PBPD. As illustrated in Figure 3-1, all PBPD takes place within racialized sociohistorical contexts that shape all aspects of professional learning, including what and how teachers notice the children, content, and practice they observe.

In Chapter 1, I related my first experience of the EML where I was struck during the debrief discussion that the other educators in the room were not noticing the same things about the children that I did. I noticed how the classroom teacher orchestrated discussions and settled classroom behavior in ways that acknowledged students' capabilities while at the same time, not jumping to any deficit-oriented assumptions about their motives or desires. I also noticed how the students had agency during the discussion to ask questions and push back on their peers' thinking. On the other hand, I noticed that I missed some amazing observations concerning the mathematical content and teaching. Other observers in the room also missed mathematical content and teaching, but, in my view, that seemed to be mostly because they were too distracted by students' behavior which made them negligent with respect to seeing the brilliance of the children. This phenomenon of educators watching the same instruction and noticing different things, and interpreting student thinking from deficit perspectives has become the focus of studies that intervene on and cultivate what Sherin (2001) terms teachers' *professional noticing*.

Professional noticing stems from three similar lines of research that were all trying to capture and explain what it looks like for groups of people with shared expertise to collectively see, understand, and make sense of objects and events (Goodwin, 1994; Mason, 2002; R. Stevens & Hall, 1998). It first showed up in the idea of "professional vision" (Goodwin, 1994). Professional vision contests the notion that everyone sees objects or events as important in the same way; rather, objects and events become meaningful when they are socially situated within context. For example, if a house catches on fire, the average person would not be able to walk into the house and decipher where the fire started or what caused it, but firefighters would be able to do so. They would be able to walk into the house and make sense of smoke patterns along the wall and other pieces of evidence to determine what happened.

Next, is the concept of "disciplined perception" (Stevens & Hall, 1998). Disciplined perceptions are groups of "events sequenced in ways that people assemble and coordinate aspects of visual displays to make practically relevant objects or conditions visible to themselves and coparticipants" (R. Stevens & Hall, 1998, p. 109). Stevens and Hall investigated two civil engineers' ability to construct roadways using different modes of visualization. Last is the idea of "intentional noticing" (Mason, 2002). Intentional noticing is "what we do when we watch someone else acting professionally and become aware of something that they do which we think we could use ourselves" (Mason, 2002, p. 30). These three ideas collectively identify and describe the ways organized groups with shared expertise engage in shared observations.

In mathematics education, Miriam Sherin developed the concept of teachers' professional noticing by focusing on the ways that mathematics education researchers and teachers noticed classroom interactions during her investigation of video clubs, including the extent to which their observations differed from one another. She proposed the idea that if teachers started to use some

of the same techniques for observing that researchers used then teachers could be guided to see and understand student thinking in less superficial ways (Sherin, 2001; Sherin, 2002). She and her colleagues defined three components of professional noticing: (1) noticing what is important, (2) interpreting what is being noticed within the larger idea of teaching and learning, and (3) using professional knowledge within context to make sense of what was noticed as important (Van Es & Sherin, 2002).

Since Sherin's introduction of professional noticing in mathematics education, researchers have branched off to study and learn more about what teachers notice, how they notice, in what ways they interpret what they notice, and how what they notice impacts their instruction and interactions with students (Jacobs, Lamb, & Philipp, 2010; Santagata, Zannoni, & Stigler, 2007; Sherin & van Es, 2009; Sherin & van Es, 2005; Star & Strickland, 2008). Over the past 15 years, researchers have used a variety of artifacts to better understand the ways in which teachers notice. In addition to videos of teaching, these artifacts include such things as student work, video vignettes, animated representations, and group discussions (Chieu et al., 2011; Jacobs et al., 2010; König et al., 2014; Scherrer & Stein, 2013). There has been less emphasis on researching professional noticing with artifacts that incorporate a real-time component, such as live instruction.

Noticing student thinking for the purposes of analysis is not intuitive. Thus, many studies of teacher noticing have incorporated learning goals around helping teachers to focus on student thinking while reviewing classroom artifacts. Researchers have been able to detect teacher growth in noticing skills over time through the following study designs: (1) observations of teachers watching videos of their own teaching and of their peers' teaching, (2) observations of teachers' conversations in collaborative reflection activities, and (3) analysis of teachers' written

reflections (Borko, Jacobs, Eiteljorg, & Pittman, 2008; Crespo, 2006; Kazemi & Franke, 2004; Santagata, 2009; Sherin & Han, 2004; Sherin & van Es, 2009; van Es & Sherin, 2010). These studies show that over time in reflective group discussions with their colleagues, teachers focused less on pedagogical moves and more on student thinking and participation (Sherin & Han, 2004; Sherin & van Es, 2009). Additionally, facilitators had to do less and less prompting to get teachers to talk about student thinking; teachers voluntarily began to discuss it on their own (Borko et al., 2008; Kazemi & Franke, 2004; Sherin & Han, 2004).

The component of time, a central factor cited by many scholars who focus on developing teachers' professional noticing, is a luxury. The EML is a two-week professional development program, and most educators only attend the first week. An extended amount of time to develop professional noticing skills is not a possibility under these circumstances. Facilitators and educators do not have the opportunity to work on learning to see Black students' brilliance for an entire school year. So, this reality forces raises the question of what is the work of facilitators to support educators in viewing live instruction in such a short amount of time. It cannot be taken for granted that just watching brilliant Black children performing brilliance and a teacher supporting brilliance with fifth-grade instruction will be visible to observers. One of the underlying questions of this research study is to better understand how to move teachers' ability to notice Black students' brilliance inside of instruction in a small and finite amount of time. This, in turn, raises questions about what should be the nature of educators' opportunities to learn in a setting like the EML.

In the next section, I unpack the notion of opportunity to learn (OTL) and how it shaped my examination of the EML as a site designed for educators' learning about Black children's brilliance and the role of instruction in valuing, foregrounding, using, and developing it.

Prebrief and Debrief: Context for Professional Learning

Different contexts create different opportunities for professional learning. As described in the previous chapter, there are many approaches to supporting in-service teachers' continued learning (e.g., school-wide, district-wide, university-based) and many different methods within those approaches (e.g., performance-based, evidence-based, research-based, inquiry-based, reform-based). These differences in approaches and methods add to the situated nature of professional development. That is, the approach and method of a given professional development program constitute key features of the professional learning context and shape teachers' opportunities to learn.

As a university-based, practice-based professional development, the EML is situated to offer particular kinds of opportunities for teachers' professional learning. Like other PBPD programs, it comprises an instructional context that is shaped by collective discussions, mathematical content, professional learning tasks, instructional artifacts, and participating educators' perspectives and experiences (Alston et al., 2018; Kang & Windschitl, 2018). Further, the live instruction component of the EML creates additional opportunities for learning by bringing children's thinking, mathematical content, and teaching practice—and the interactions among them—to the surface for educators to analyze and discuss together.

Within the supporting structures of the prebrief and debrief sessions, the facilitator, teacher, and participating educators (collectively, the actors) negotiate shared experiences of the live instruction, using their personal experiences and perspectives on teaching and learning, Black students' capabilities, and mathematical content as lenses. The actors' combined set of experiences and perspectives mediate their interactions with one another around the live instruction, which, in turn, mediate the construction of opportunities for learning within the

prebrief and debrief (Valencia et al., 2009). For example, the questions that are publicly asked and answered represent a negotiation between the educator and facilitator and/or teacher in which the educator's question must be understood as stemming from particular experiences and personal goals for learning, and the facilitator's and/or teacher's responses reflect their own personal experiences and intended goals for educators' professional learning.

Moreover, the live instruction component of the EML can provide unique and powerful opportunities for learning that are deeply tied to the identities of the teacher, students, and observing educators. The different sociocultural histories and narratives attached to different racial groups, genders, social classes, etc. shape the sense that the actors make of what occurs during live instruction and how they negotiate meanings with one another during prebrief and debrief. Changing the identities of any of the EML participants would initiate a different set of expectations, perspectives, experiences, and historical footings for the actors to negotiate in their sense-making around the live instruction, which would ultimately shape different opportunities for learning.

Live Instruction

I argue that it matters that the EML features a White teacher instructing Black children for an audience of White educators during live instruction. These components, as part of the instructional context, add further levels of complexity that actors must negotiate in order to see the brilliance of Black children. The live instruction allows the heartbeat of classroom teaching to permeate the entire space in a way that does not happen when watching pre-recorded videos of instruction. During live instruction, educators can observe and feel the breath and rhythm of the teacher and the children. Every action, reaction, interaction, and moment is raw, unpredictable,

and alive. For this reason, engaging teachers in observing live instruction has the potential to humanize Black children in a way that pre-recorded video cannot.

Pre-recorded videos are detached from reality and the sense of immediacy that accompanies live instruction. As such, they can come off as actors in a far-off place or a staged studio, desensitizing viewers to the humanity of the video subject. I argue that this desensitization makes it less likely that teachers will question their practice or the practice of others in a critical way because they don't feel the stakes of instruction the way they do during live instruction. Video recordings make it difficult to observe the rhythm, breath, and heartbeat of a classroom, especially when teachers are shown just a short, edited clip. In addition, when watching short clips, observing educators know that someone has decided ahead of time what the important features are and has specifically chosen the clip for their own preconceived reasons. However, when observing live instruction, I have seen educators on the edge of their seats with anticipation because, even with the most well thought out lesson plans, there is still a high degree of unpredictability in how lessons will unfold. PD facilitators *cannot* pre-determine what the important features of instruction will be or what educators should pay attention to. Live instruction is both exciting and authentic to educators' professional experiences inside of the classroom because it provokes many of the same emotions that teachers feel as they walk into their own classes. They cannot predict what will happen from moment-to-moment or day-to-day; they have to make their own decisions about where to look and when.

Ultimately, because of the sense of immediacy and authenticity that accompanies live instruction, educators who attend the EML develop genuine feelings and emotions for the children and the teacher they are watching. The live instruction at the EML creates space and time for educators to experience the spectra of joy and anger and to confront and unpack

emotions, many of them shared, with a community of professionals. Observing live instruction fosters a sense of urgency because observing educators begin to feel responsible for students' learning. This sense of responsibility is why educators voice anxiety when mathematical ideas are left unfinished at the end of a lesson or when the teacher allows incorrect ideas to linger in the classroom. Year after year, educators who attend the EML are always worried about when the teacher is going to finish, when students are going to "get it."

Further, the live instruction presented inside of the EML is slightly different from observing a colleague's class because the EML creates space for educators to observe across time. Even when educators are able to go to their colleagues' classrooms to visit, it is for a single lesson or a single day; when they watch a video clip instruction, it often reflects a single fragment of a lesson. The EML, by contrast, stretches across 10 days, and educators are granted access to the "full story" of instruction from inception to planting the seed of a mathematical concept to building up the concept to growing the concept into subsequent mathematical ideas. When "perfect moments" occur, observing educators do not have the luxury to jump in and out, replaying and discussing them at length before moving on to the next moment. Instead, educators have to make sense of them in real time with all the imperfect moments.

Most importantly, the live instruction component of the EML affords the opportunity for educators to see Black children as real people who are earnest, who can learn, and who can take on challenging content rather than as the stigmas typically associated with them in schools and society. It also, provides the space to allow educators to question their own beliefs. This is because live instruction affords educators the opportunity to get much closer to real teaching and learning than in other types of PD. Unfortunately, it is also the case that live instruction brings educators so close to teaching that there is no time to suspend their internal biases. The

environment is too intense, too real. Thus, during the years I have participated in the EML, I have found that live instruction often reveals the rawness of educators' biases and how they shape educators' thinking, despite the claims participating educators may make to being anti-racist, to being open-minded, or to believing in Black children.

The observation of live instruction component of the EML is so textured and complex that it creates both an opportunity and essential challenge for the facilitators: how to surface and intervene on stereotypical ways of viewing children in real-time given that the community of observers are pulling from various levels of experience and exposure to Black students, mathematical content, and teaching practice. This demands that the facilitators design and facilitate activities and discussions that accommodate all levels of access, while also ensuring that they protect the dignity and humanity of the Black children at the center of instruction.

Opportunities to Learn

Equal educational opportunity is a concept that has been constantly shifting and shaping Black students experiences in school since the desired notion of 'separate but equal' was challenged in the Plessy v. Ferguson court case in 1896 (Baratz-Snowden, 1993). Black families in 1896 and Black families in 2020 desire the same thing, assurance that their children will get equitable opportunities to learn. But what does it mean to offer Black students those type of opportunities? How is that desire actualized in the classroom? Educational policy researchers have grappled with these ideas for decades.

History of the construct

In research on teaching and learning, opportunity to learn is a conceptual framing used to investigate what is there to learn, how is it learned, and how much time was allocated for learning (Berliner, 1978; Elliott, 2015; Kurz et al., 2014; F. I. Stevens, 1993). Opportunity to

learn (OTL) first appeared in research as one of Carroll's (1963) five constructs for learning in school. Carroll's work was centered around the amount of time students had to learn content. A few years later, Husén (1967) expanded the construct to investigate the relationship between the content taught and the content assessed. More specifically, he analyzed the overlap between the two. Husén's work was centered around the quality of instruction and to what extent the content was represented on assessments. Berliner (1978) later extended the construct to analyze the relationship among allocated time, engaged time, and the level of difficulty of the task (Berliner, 1978). Building on this earlier work, Stevens (1993) proposed an OTL framework comprised of four elements: content coverage, content exposure, content emphasis, and quality of instructional delivery (Stevens, 1993). The OTL framework, for the most part, has been used in educational policy research as a response to concerns about unequal resources and access to knowledge. The components that are similar across these original studies of OTL are researchers' emphasis on time spent on task and quality instruction. These studies seem to suggest that spending more time and choosing better tasks, and affective instruction would produce equitable learning opportunities for students.

Generally, in opportunity to learn studies time spent on content and quality of content are two variables that that researchers intervene on in order to obtain a particular outcome (Tate, 2001). Desired outcomes are driven by a set of preconceived content standards for K-12 students. This study affords me the opportunity to investigate one case of a professional development that holds constant the brilliance of Black students, while supporting educators to take on ambitious mathematics instruction. Additionally, within this study I am able to explore the amount of time that was invested and the quality of those investments.

Opportunity to Learn in Teacher education

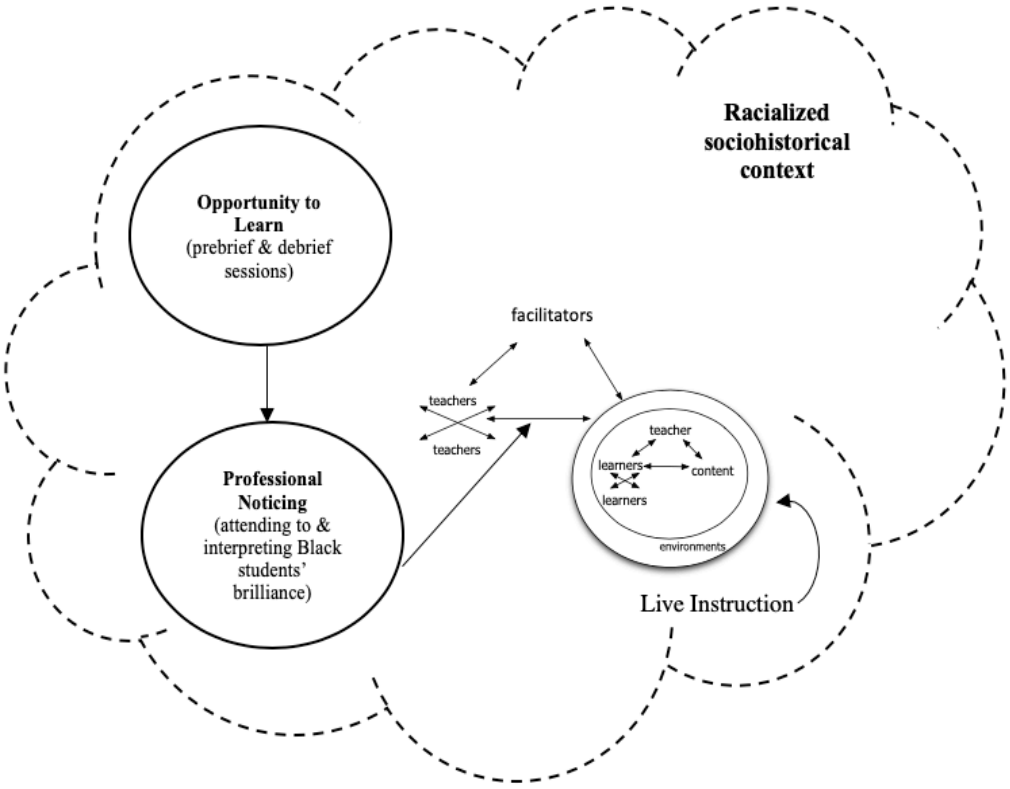
Although *opportunities to learn* is a framework that is often used for curriculum analysis (e.g., Remillard & Bryans, 2004), some studies, particularly those focusing on teacher education, use *opportunities to learn* to simply identify "events when content is made available" (Cohen & Berlin, 2019; Kang & Windschitl, 2018; Schmidt et al., 2011). For this study, I operationalize *opportunity to learn* (OTL) as events (e.g., discussions, instructional activities, etc.) that support educators' observation and analysis of live instruction. It is important to note here that the OTL in this study were not universally available. Some teachers walk into the EML and have enough starting knowledge and recognize that the instruction is novel and still recognize there are things to learn from it, while others do not. However, as a researcher, I attempted to identify both what supports educators needed to notice Black children's brilliance as a resource for teaching mathematics and what supports were made available to them during the prebrief and debrief sessions, whether or not educators took them up. I do not measure if educators learned anything; instead, my goal was to categorize what was possible for educators to learn in their interactions around live instruction.

Figure 3-3 summarizes my conceptual framework and illustrates what I am focusing on in the PBPD instructional context. The arrow between the facilitators and the educators represents the negotiated interactions that occur within the prebrief and debrief sessions of the EML. These are the OTL that I am interested in this dissertation. The arrows going from teachers to the live instruction represent what teachers notice about children's thinking, the mathematical content, and teaching practice. I argue that the OTL available during the prebrief and debrief sessions influence what and how educators notice and interpret what happens during the live

instruction, creating openings for this PBPD to either disrupt or reinforce existing racial narratives.

Figure 3-3

Illustration of Conceptual Framework



Chapter 4
Research Methodology and Design

In this dissertation, I investigate a practice-based professional development (PBPD) program that bring race and identity to the fore while layering teaching practice, mathematical content, and student thinking. The purpose of this dissertation is to identify opportunities to learn in a short-term PBPD that emphasizes the race and identity of students as part of the work of teaching. I identify patterns that existed in educators' observations of practice and consider to what extent educators took up available opportunities to learn as reflected in the way they attended to, interpreted, and constructed the brilliance of Black children's thinking. To do so, I analyzed data from a week-long professional development, which comprised video records, digital logs, interviews, and professional development artifacts. In this chapter, I describe the research methods of the study and discuss the: (a) rationale for the research approach; (b) methods of data collection; and (c) data analysis and synthesis.

Rationale for Research Design and Approach

In the previous chapter, I provided evidence that practice-based professional developments are ripe with learning opportunities for teachers. I have also argued that since PBPD, by design, gives educators opportunities to analyze Black students' mathematical thinking and learning, then it also provides opportunities for participants to analyze instruction through lenses that are stained with racism and bias. These troubling ways of viewing Black students are not easily detectible since they often occur in silence and are not explicitly shared

with others. It is even less clear how to support and intervene on these harmful ways of viewing children without extended professional support.

This dissertation is an initial attempt to imagine how to design and enact PBPD that supports participants' ability to see the brilliance of Black children in mathematical spaces. I used the conceptual framework outlined in the previous chapter to guide my data collection choices, analytic inquiry, and identification and explanation of codes (Ravitch & Riggan, 2012). I use empirical data to offer the field a more in-depth conceptual understanding of practice-based professional development and its potential to intervene on the way that educators notice student thinking. In addition, my identity as a Black woman scholar was an important resource in thinking about what I was trying to learn and how that would inform my data analysis.

Overview of Case Study Design

I conducted a single-case study (Ravitch & Riggan, 2012; Yin, 2018) to examine the opportunities to learn offered in a week-long PBPD. The study explores a single practice-based professional development program, the Elementary Mathematics Laboratory (EML), as a case of PBPDs that have the intended goal of disrupting inequities in mathematics classrooms. I selected the EML as my case because it is designed to coordinate and make visible the mathematical thinking of Black children and the teaching practice that supports it. The EML has two components that make it unusual in continued teacher education: (1) it is designed around engaging teachers in examining practice through live instruction, and (2) it features a class with a majority of Black students and a White teacher.

In order to answer my research questions, I developed two units of analysis. The first unit of analysis focuses on the opportunities to learn available during the prebrief and debrief sessions

each day. The second unit of analysis focuses on participants' reactions to opportunities to learn in the prebrief and debrief sessions. See table 4-1 for a description. The analytic advantage of using two units of analysis for a single-case study is that it allows me to separate and analyze two different components of the PD, as well as look across both analyses to make inferences about the entire professional development experience. By adopting a single-case study design, I was able to explore the prebrief and debrief sessions that are in place to support participants and also explore how participants took up supports offered in those sessions.

Table 4-1

Description of Single Case Study

Concern: Ample evidence exists that PBPD in which teachers observe teaching provides them with an important opportunity to see and unpack the work of teaching. However, in cases in which the children involved are children of color, educators' racial narratives strongly influence what they focus their attention on and how they interpret children despite professed commitments to equity. Black children are not seen as brilliant in mathematical spaces.		
Case of a PBPD program	Units of analysis	Research Questions
Elementary mathematics laboratory (EML)	Opportunity to learn	What opportunities to learn were offered in the practice-based professional development structures surrounding "live instruction" to support participants to see the brilliance of Black children's mathematical thinking in practice?
	Participant reports	What patterns exist in the way that participants took up opportunities to notice and interpret Black children and the work of teaching in real time?

The Research Setting

Each summer, the Elementary Mathematics Lab (EML), a week-long practice-based professional development for practicing teachers and teacher educators, is held at the University

of Michigan. The PBPD components of the EML are designed to wrap around a summer mathematics class for rising fifth graders. Facilitators of the PBPD use this class as a "common text" to provide opportunities for educators to observe students as they engage in ambitious mathematical work. The EML also provides opportunities to investigate teaching practice that supports students to use and extend their competence. I selected the EML as the site for this study for three reasons: (1) It is built around a public teaching component; (2) the majority of the students are Black; and (3) the classroom is embedded in a white space.

First, the EML design has a "public teaching" component that supports educators' learning by creating a common text for study. Public teaching consists of three actors: teacher, students, and observing educators (see Table 4-2 for more descriptions).

Table 4-2

Description of the Actors

Actors	Descriptions
Teacher	Refers to the classroom teacher who enacts mathematics instruction with fifth-grade students. She is a White woman with over 30 years of teaching experience. She has taught at each EML since 2007.
Students	Refers to fifth-grade students who are attending a two-week summer mathematics program.
Educators	Refers to adults who attend the EML to observe instruction and participate in PBPD learning

Public teaching is an innovative component that can offer educators an assortment of learning experiences because it makes teaching and learning visible to the participants of the PD. The basic set-up of a public teaching is that the teacher instructs the students while the observing

educators watch and analyze the teacher's practice. Public teaching also has two surrounding structures: the prebrief and debrief sessions. The surrounding structures are spaces to prepare observers to watch live-instruction (prebrief) and then make collective sense of what they saw (debrief). This "public teaching" feature creates opportunities to make concrete and visible the work of teaching. It also enables participants to investigate in detail the myriad interactions and considerations that comprise the complex work of teaching.

Second, the EML provides a space for teachers to see Black students, who are typically marginalized in classrooms, engaging with challenging mathematical tasks and ambitious social and intellectual practices. The teacher and facilitator work together to disrupt narratives that educators bring with them into the PD that perpetuate stereotypical expectations of these students. This experience is often powerful for teachers because they are not used to seeing students who were positioned as "struggling" and "lacking confidence" by their fourth-grade teachers operate in ways that are counter to these deficit narratives. I provide more details about the students below.

Finally, race and identity are hypervisible because the EML, in its entirety, is embedded within a white space. The institution is predominantly White, the teacher is White, the observers are predominantly White, and the staff is predominantly White. Moreover, the racial mismatch between the children and the adults in the EML is even more pronounced because all of the attention is focused on the children. The hypervisibility of race and identity are likely magnified because these Black children are negotiating their mathematical identities in this white space, where they are watched constantly. The setting reflects my central concern: Just because Black children are presented as capable and are seen doing complex mathematics does not mean that observers of all racial identities are capable of seeing that brilliance. It also offers a special

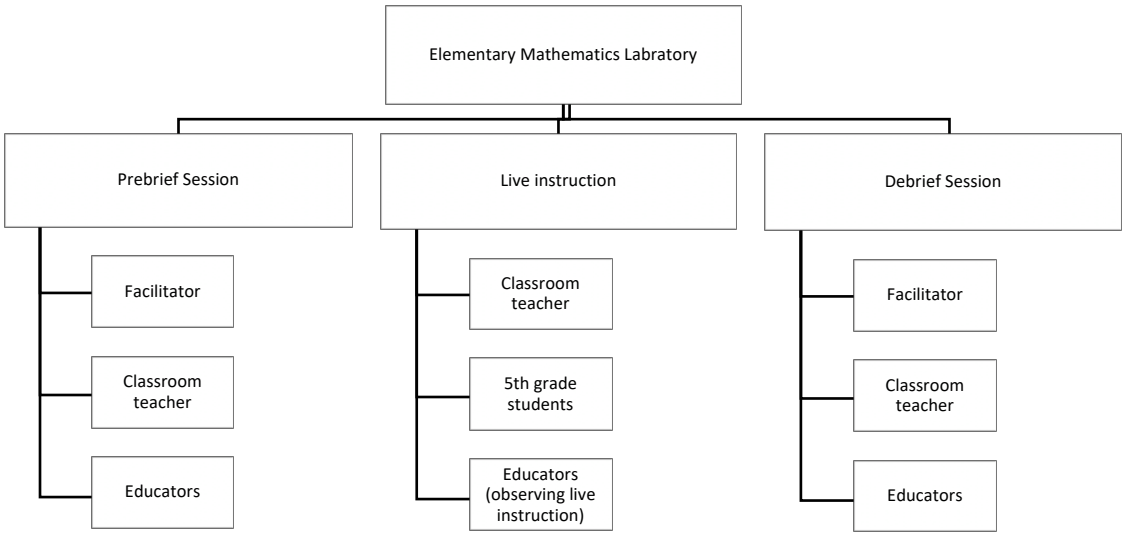
context for studying what components are possibly influential in helping participants of a practice-based professional development see and appreciate the mathematical brilliance of Black children.

The EML Design

Every summer, since 2007, an Elementary Mathematics Lab (EML) is held on the University of Michigan campus. The EML serves as a professional learning opportunity for educators to witness students of color engage in ambitious mathematical work, investigate the type of instruction that supports students doing ambitious work, and explore features of teaching practice that support children to use and extend their competence. The EML offers educators many opportunities to study curriculum design, examine high-leverage teaching practices, observe student thinking, analyze student and teacher artifacts, and reason with colleagues the teacher's decisions and the students' work. Next, I will describe three major components of the EML: Prebrief, observation of public teaching, debrief. I recognize that the EML as a whole is a complex and layered space, which shapes both participants' experiences and my analysis. Figure 4-1 is a diagram that illustrates all the different components and who is involved in each.

Figure 4-1

Organizing Structure of EML



Each day of the EML, educators attend all three components of the PBPD because they work together collectively to support attendees. See Table 4-3 for the EML's complete attendee schedule. I will refer to the prebrief and debrief as "supporting structures." I will discuss these supporting structures in greater detail below.

Table 4-3

Participant Schedule

Time	Activity
8:00 – 8:30	Breakfast and distribution of resources
8:30 – 9:30	Prebrief
9:30 – 9:45	Break
9:45 – 12:00	Observation of public teaching
12:00 – 12:15	Student notebook analysis
12:15 – 12:30	Break
12:30 – 1:30	Debrief

The EML summer mathematics class. Even though the summer mathematics class that the fifth graders experience is not the focus of this dissertation study, it is important to understand its context. The summer mathematics class runs for ten days, for 2.5 hours each day. The mathematics topics that are covered during the two-class include fractions, number systems, algebraic equations, and mathematical practices.

In order to recruit students to be a part of the class, the EML partners with a local school district and asks fourth-grade teachers to nominate any students who fit into any of the following categories (TeachingWorks, 2017):

- Students who have not done well on mathematics tests or assessments
- Students who have scored quite well but may have other difficulties such as completing homework or explaining their work and reasoning to others

- Students who seem to understand the material in one context but seem lost in other instances
- Students who lack confidence, motivation, or certain key skills
- Students who are multilingual and need support with the linguistic demands of mathematics learning

The recruited students and families reside in a community where the average income earned per person, $24,860, is two-thirds less than the neighboring community in which the University of Michigan, that hosts the EML, is located (U.S. Census Bureau, 2017).

A total of 22 students were randomly selected to attend the 2017 summer mathematics class. The students and their families were not asked to identify their race or ethnicity, but, based on informal observations, the 2017 class was predominantly Black or African American (students whose background originates from African descent), along with a small number of Latinx and White children. The racial make-up of the students selected for the class is representative of the demographics of their home school district. See Appendix B for an overview of the summer mathematics program for students.

Prebrief. The prebrief and debrief sessions are both led by two program facilitators, one of whom is the EML teacher. Prior to the start of the mathematics class each day, educators are given resources which include lesson plans, homework, handouts with the mathematical task of focus for the day, and seating charts. First, educators are given time to individually analyze the day's lesson plan and work through the students' mathematical tasks for the day. The facilitators of the EML lead a group discussion around what the goals of the day are and elicit feedback and suggestions from the educators in regards to lesson plans. The classroom teacher also uses this structure to inform educators about specific students and specific goals and plans of action for

targeted students (e.g., trying to get a student to share in a large group; support a student in writing in his or her notebook).

Observation of live instruction. During the public teaching component, an experienced teacher instructs a group of rising fifth-grade students from a nearby school district, while an audience of up to 100 educational professionals watch live. Public teaching is an innovative component that can offer educators an assortment of learning experiences because "it makes teaching and learning visible to the participants of the PD" (Ball et al., 2013). During live instruction, the teacher enacts the lesson plan that was discussed during the prebrief. This two-hours of daily instruction mirrors many of the same activities that can be seen in a regular classroom, such as setting norms, engaging in group work, direct instruction, working with manipulatives, working individually, and participating in whole-class discussions.

During instruction, educators follow along with the lesson plan and examine teaching practice, and students, closely. The classroom is set up so that the students' desks are in a U-shape, and behind the students' desks are chairs on risers for the educators to sit in to observe the teaching (see Figure 4-3 for a picture of room). The observing educators receive a copy of the seating chart, with photographs of each student and the children's names. Everyone involved understands that this is an atypical classroom set-up and that special efforts are made to normalize the experience for the children (e.g., by imposing strict rules on observers in the classroom; by ensuring that educators are kept separate from kids outside of instructional time).

Figure 4-2

Image of the Public Teaching Set Up

Note. The blue chairs are where the educators sit. the white chairs are where the students sit.

Debrief. The debrief component begins with a student notebook gallery walk immediately after the children leave the classroom each day. Throughout the public teaching component, students complete their work in grid-lined individual notebooks. The gallery walks allow educators opportunities to examine the notebooks and see evidence of student thinking for each day. As the week progresses, they are able to track students' thinking across multiple days of instruction. After educators examine students' notebooks, the classroom teacher reflects aloud on the class for about ten minutes.

Then, a facilitator, who is not the classroom teacher, leads a discussion with the educators. At this point, the classroom teacher removes herself from the discussion and sits off to the side to listen and take notes. This is a transparent move, and all in the room are aware of it. This move allows the teacher decenter herself from the conversation and give space for the

educators to discuss and analyze instruction. The facilitator uses the group discussion to highlight teaching practices and evidence of student thinking that took place during live instruction. The facilitator also helps make connections for educators across ideas, practices, and content from previous classes. Educators use this time as an opportunity to pose questions about decisions the teacher made or about anything else that happened during live instruction that they are curious about. After the discussion, the teacher rejoins the conversation and makes a few closing remarks, which often include answering educators' questions that came up during the discussion.

Research Participants

One-hundred twenty educators registered to attend the 2017 EML. The registered educators came from many different professional areas within education which included practicing K-12 teachers, mathematics specialists, coaches, educators who play a supportive role (e.g., administrators, program coordinators, consultants, mathematics interventionists, etc.), and educators from higher education (i.e., teacher educators, pre-service teachers, graduate students, researchers). The diversity of attendees adds to the collaboration and collective analysis of the summer mathematics class.

When each educator registered to attend the EML, they were able to choose which afternoon professional development workshop they would like to attend and also indicate if they were interested in participating in a research study. For this study, I identified educators who both chose the afternoon PD "Examining Children's Mathematical Understanding" and indicated in the affirmative that they were interested in participating in a research study. I emailed all educators from this subgroup with details about the study along with a waiver to indicate their desire to either participate or decline participation. Nineteen educators with a range of teaching

experiences responded in the affirmative. Out of that 19, only five were eligible to participate due to many of the participants changing their choice of afternoon workshop before the first day of the EML. Each participant completed an online survey about their professional experiences and demographic data before attending the EML. I describe the backgrounds and other characteristics of the five participating educators in more detail in Chapter 6.

Data Collection

My two research questions guided data collection and analysis. The first research question was designed to analyze the PBPD supports participants received during observation of the live instruction, prebrief and debrief sessions. To answer the first research question, I collected video records of the prebrief and debrief sessions, field notes from my observations of those two structures, and artifacts from the prebrief and debrief as well as from the mathematics class. The second research question was designed to analyze to how participants reacted to (e.g., took up) the supporting structures available to them. To answer the second research question, I collected participants' digital logs of their experiences during the EML and interviews conducted after the EML had ended.

Video Records

Video recording, used to capture real-time data, is a powerful method of data collection in social research, especially when researchers are trying to capture interactions between individuals. The EML is a complex space in that it includes a prebrief, summer mathematics classes, and a debrief, with multiple actors interacting in each of those spaces. For this study, I took advantage of the fact that the EML is professionally recorded for research and teaching purposes to capture video records of all facets of the EML across the whole week. These recordings comprise a total of 25 hours of high-quality video and audio that were professionally

captured by manned video cameras and a sound engineer. The quality of the audio and video enable me to see and hear much more than I typically would have access to if I were recording myself.

Field Notes

Since the video recordings still only captured the perspective of where the camera was pointing (i.e., usually whoever was speaking at a given moment), I took field notes to capture contextual information that might not appear on-camera as well as significant interactions to review later in the recordings. I took open-ended field notes each day as I observed the prebrief and debrief sessions in order to construct "thick rich descriptions of the study context" (Phillippi & Lauderdale, 2018, p. 27). I paid particular attention to the moves that the facilitators were making to guide the conversation, and I noted specific things that they were explicitly highlighting for the group. I also noted ideas and questions that the educators brought up to discuss with the facilitators and the larger group. In addition, I kept a running record of which children came up in the discussion and what was said about them. There were moments when I captured multiple types of these observations at the same time. For example, if an educator made a comment that perpetuated a negative stereotype about a Black student, I noted the student and comment as well as the facilitator's moves to intervene on the comment or if they missed an opportunity to intervene.

Artifacts

Artifacts from the EML came from the prebrief and debrief sessions and the summer mathematics class. The artifacts I collected from the prebrief and debrief sessions include communication packets to participants, detailed lesson plans, seating charts, and mathematical

tasks. The artifacts I collected from the summer mathematics class include student surveys, student notebooks, classroom posters, and student homework.

Digital Observation Logs

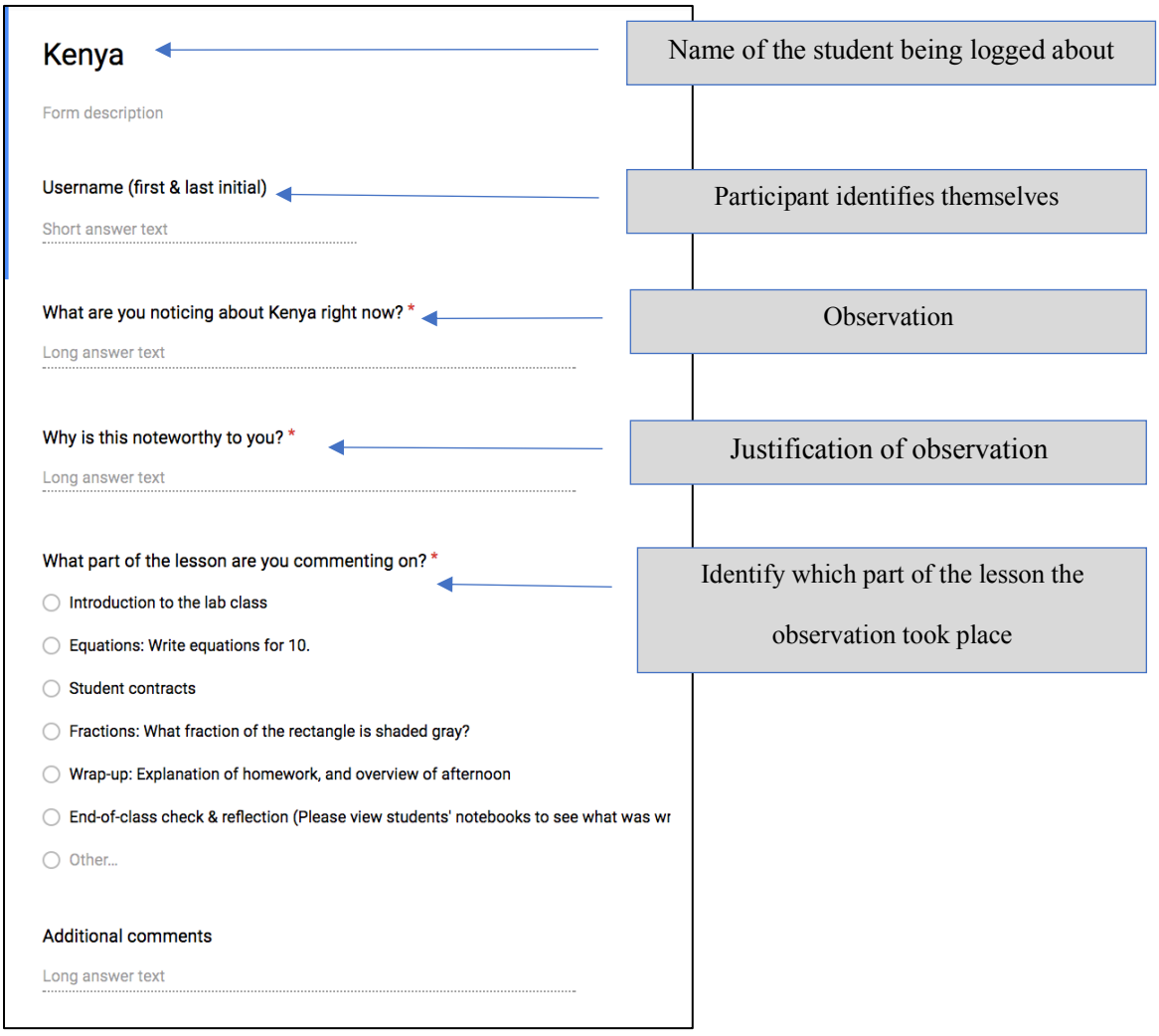
Self-reports enable participants of a study to give first-hand descriptions or accounts of an event, set of events, or behavior (Jupp, 2006). Common self-reporting instruments include surveys, logs, and cognitive interviews (Stecher et al., 2006). A log is a self-report that is similar to a survey but is used to collect data more frequently. Logs support research participants to recall more clearly about their observational activity; they also enable researchers to gather data from participants across a span of time during their participation (Choy, 2001; Desimone et al., 2010; Rowan et al., 2004; Stickles, 2011).

For this study, I designed and implemented digital observation logs as a method of data collection. Although, it has been well documented that teachers need time to develop competencies around professional noticing, a major consideration for this study was thinking about ways to support participants in self-reporting their observations without the luxury of extended time to develop professional noticing skills. Since this dissertation is built on the premise that it is imperative to intervene on biases that surface when teachers are analyzing classroom interactions in real time, I designed a website to enable participants to log what they noticed *in-the-moment* during live instruction each day. I also included features that were designed to support participants to notice the mathematical brilliance of Black children in mathematics class (e.g., features to name the student, features to identify why what they were noticing was noteworthy, and features to focus attention on mathematical thinking). Participants were assigned unique log-ins so that I could identify who had recorded which noticings. In order to support participants to be as clear about what they noticed as possible, I designed intentional

ways for them to easily identify which student and which part of the lesson they were referring to during their observations. The website was a living platform that changed and shifted daily to meet the needs of the participants. See figure 4-4 for an example of the log participants filled out.

Figure 4-3

Image of Set of Questions About a Particular Student



Interviews

I conducted and audio recorded one-hour long phone interviews with each of the five participants during the week following the end of the EML. I designed an interview protocol that

loosely used two features from cognitive interview methodology: think-aloud and verbal probing (Karabenick et al., 2007). I used think-aloud features to get participants to verbalize what they were thinking and noticing while observing live instruction (Desimone & Le Floch, 2004). In addition, I used verbal probing to probe participants for additional information when their responses lacked detail or clarity. Some of my probing questions were scripted prior to the interview and some were spontaneous probes in response to what participants said.

I designed the interview protocol to gather information from participants that would not have been captured in their daily logs. The complete detailed interview protocol including all questions and probes is found in Appendix C.

Ethical Considerations

Qualitative research is generally vulnerable to ethical issues (Bloomberg & Volpe, 2016). I took several steps to ensure that I protected the rights of my participants as well as those of the students from the summer mathematics class. Each individual who agreed to participate in the study signed an informed consent and was given a pseudonym to maintain confidentiality. I also do not include any additional identifying information about the participants such as the name of their schools. Unlike participants, I use the real first names of the students in the summer mathematics class, as permitted by their families and the EML IRB. Finally, I store all data digitally and with password protection.

Data Analysis and Synthesis

My research questions for this study are:

1. What opportunities to learn were offered in the practice-based professional development structures surrounding "live instruction" to support participants to see the brilliance of Black children's mathematical thinking in practice?

2. What patterns exist in the way that participants took up opportunities to notice and interpret Black children and the work of teaching in real time?

Analytic Process

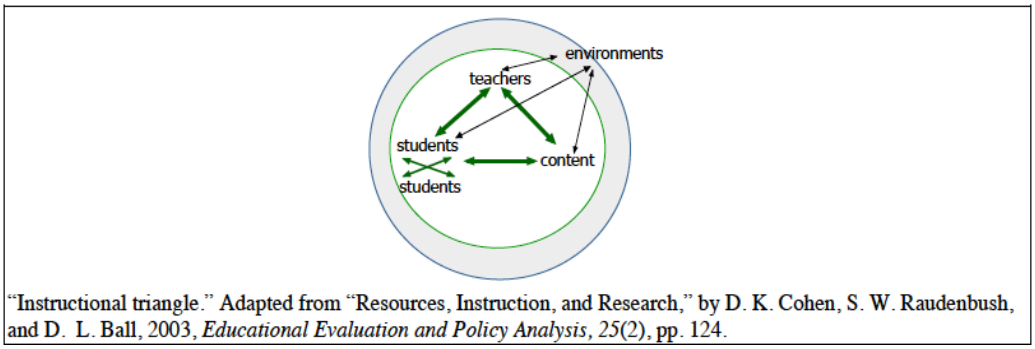
I analyzed data from this study in two different phases. Each phase connects with one of my research questions. I used the same interpretive lens for both phases of analysis. I turn next to discuss this lens and how I used it. I then describe my analytic process for each unit of analysis.

Interpretive Lens: Instructional Triangle

The prebrief and debrief sessions were designed to be a collaborative study of the complex work of instruction. I therefore looked for opportunities to learn that were embedded in the bidirectional comments, questions, and reflections between the facilitators and educators about instruction. In order to bound the scope of analysis, I focused my attention on the different components of the instructional triangle. The instructional triangle is made up of four components: Teacher, students, content (in this case, mathematics), and the environment. The framework that is depicted below in figure 4-4 shows the interactions among these four components (D. K. Cohen et al., 2003). Each component has a direct bearing on the others. In the case of the EML the fact that the students are Black and are in a two-week summer mathematics class, shapes both the teaching practice and the content. The two supporting structures are communal spaces that makes visible for educators the intricate connections among each of these components and present many opportunities for educators to learn.

Figure 4-4

Instructional Triangle



"Instructional triangle." Adapted from "Resources, Instruction, and Research," by D. K. Cohen, S. W. Raudenbush, and D. L. Ball, 2003, *Educational Evaluation and Policy Analysis*, *25*(2), pp. 124.

Unit of Analysis #1: Opportunities to Learn in Prebrief and Debrief Sessions

This phase of my analysis focused on my first research question, which was meant to examine the opportunities to learn in the structures of the EML that supported educators to observe the brilliance of Black students in the summer mathematics class. This phase of the analysis focused on video recordings, field notes, and artifacts.

Video data. I first coded the video recordings from each prebrief and debrief session from the first week of the EML. There were ten videos in total. I watched each video chronologically, in one-minute segments, and coded what was happening during the majority of each minute. The initial codes I applied to each minute of video were influenced by the components of the instructional triangle framework. For example, … The applied codes were broad enough to capture opportunities for educators to increase their pedagogical content knowledge, their understanding of Black students within this environment and in schools more broadly, and their understanding of the teacher and teaching practice that disrupts inequities. I also coded the goals and opportunities to learn explicitly named by facilitators in both structures.

In many instances, a one-minute long segment was assigned more than one initial codes. In my findings chapters, I refer to these first-level codes as "themes."

I then re-watched each video and conducted a second level of coding. I refer to my second-level codes as "categories." I used existing literature to break down the theme *Mathematical Content* into three categories: Content and students, Content and teaching, and Content and curriculum (Ball et al., 2008). For the remaining themes, I formed categories. I looked across all the codes under each theme and separated them into similar groups, and those groups became the categories. A sample of the codebook is below in Table 4-4. For the complete codebook see Appendix D.

Table 4-4

Sample of Coding

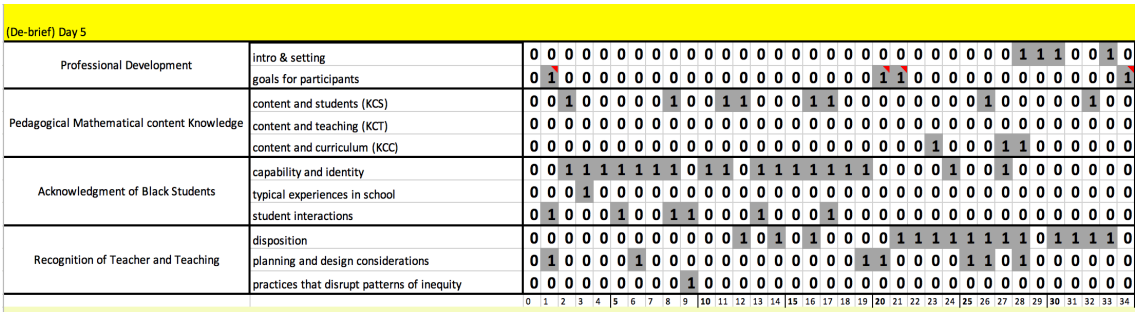
Themes	Categories	Aspects
Initial codes	**2nd Level Codes**	**Descriptive Codes**
Mathematical content	Content and students	1. Student thinking (individual and class)
		2. Typical trends of student thinking and experiences with content
		3. Mathematical practices
	Content and teaching	1. Use of materials and manipulatives
		2. Instructional support given specific to the content
	Content and curriculum	1. Decomposing the task or mathematical space for teaching
		2. Helping educators understand or think deeply about core mathematical ideas
		3. Common core state standards
		4. Scope of content/curriculum of the EML

Figure 4-6 shows a sample of second-level coding for the debrief on Friday. The existence of a code is indicated with a 1 and the nonexistence of the code is indicated with a 0. The minutes are represented in the last row of the figure. It is important to note here that each

video was one-hour in length, but I removed segments of videos when educators were silently reading the daily lesson plan, working independently on the mathematics, or asked to discuss topics with a partner. The timestamps captured below are only representative of whole group discussions.

Figure 4-5

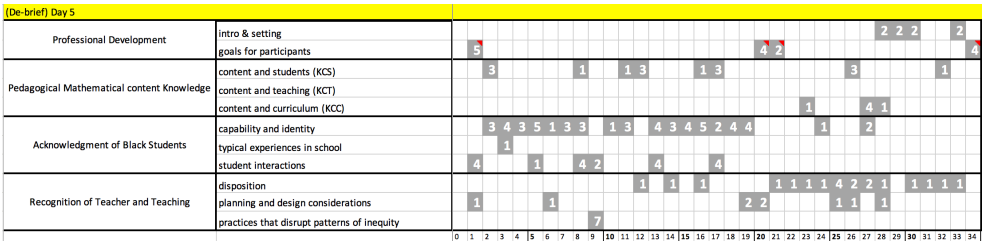
Sample of Dichotomous Coding Scheme



| (De-brief) Day 5 | | |

Figure 4-6

Sample of Descriptive Coding Scheme



Field notes and artifacts. I coded my field notes and the professional development artifacts to enhance the quality of my qualitative findings from the video analysis (Phillippi & Lauderdale, 2018). I used the instructional triangle to identify patterns of behavior or interactions captured in my field notes that corresponded with themes identified in video recording data. In addition, I coded field notes to track when and in what ways students' names were present throughout the prebrief and debrief sessions. I coded artifacts for intended learning goals as well as for features of the supporting structures that artifacts made available.

Unit of Analysis # 2: Participants Take-up of Opportunities

This phase of my analysis focused on the second research question, which was meant to examine the ways that participants took up the available opportunities for learning that might have supported educators to observe the brilliance of Black students in the summer mathematics class. This phase of the analysis focused on interview data and participants' daily logs.

Coding participant logs. I started this phase of analysis by looking closely at the digital logs. The digital log were analyzed by crafting memos, and then a cycle of coding, and a second cycle of coding (Saldana, 2016). Crafting memos consisted of reading through the logs one participant at a time and then writing a memo about each participant. For example, I would pick

one participant and read through their logs for the entire week. After reading through the entire week, I would write a narrative about the participant with just my first impressions of them. The second stage of log analysis was my first cycle of coding. This study is an exploratory study; therefore, I used a holistic coding method. I went through the logs and coded topics that participants logged about and then looked for patterns of common topics across multiple log entries. I went back through the logs multiple times, defining and redefining codes, each time looking for patterns across the logs. The last stage was the second cycle of coding. In this cycle, I clustered codes together to create categories and then themes.

Coding interviews. I conducted one, one-hour interview with each participant during the week after the EML. I asked each participant the same set of questions which I had designed with the interpretive lens in mind. Interviews were audio recorded and transcribed for coding. To analyze the interviews, I first conducted a round of descriptive coding, looking across all participants' responses question-by-question. I then conducted a round of topic/thematic coding to identify major topics or themes that emerged from their responses. Based on the analytic coding, I created a memo for each interview question with a summary of categories of findings from each participant as well as a set of categories across the participants collectively. The categories are presented in chapter 6. Below in table 4-5 is a summary of data collection.

Table 4-5

Description of Single Case Study

Concern: Ample evidence exists that practice-based professional development (PBPD), in which teachers observe teaching provides them with an important opportunity to see and unpack the work of teaching. However, in cases in which the children involved are children of color, educators' racial narratives strongly influence what they focus their attention on and how they interpret it despite professed commitments to teaching all children. Black children are not seen as brilliant in mathematical spaces				
Case of PBPD Programs	Units of Analysis	Research Questions	Data Collection	Analytic Process
Elementary mathematics laboratory (EML)	Opportunity to learn	What opportunities to learn were offered in the practice-based professional development structures surrounding "live instruction" to support participants to see the brilliance of Black children's mathematical thinking in practice?	Video records Field notes Artifacts	Major analysis: Video records 1. Time coding 2. Descriptive coding 3. Topic/thematic coding 4. Analytic coding Minor analysis: field notes and artifacts 1. Holistic coding

	Participant Take-Up	What patterns exist in the way that participants took up opportunities to notice and interpret Black children and the work of teaching in real time?	Interviews Digital Logs	Coding for both interviews and digital logs took place in these phases 1. Descriptive coding (who, what, where, and how) 2. Topic/thematic coding

Summary

I analyzed multiple data sources to investigate which opportunities for learning were available for educators during the EML and how participants took up those opportunities. I drew from data including video recordings of the prebrief and debrief, field notes, artifacts from PBPD and instruction, participants' daily digital logs, and participant interviews. Some limitations of this methodology include the small number of participants (five) and limited access to what participants were noticing. Limitations will be discussed further in the concluding chapter.

Chapter 5
Opportunities for Learning

The focus of this dissertation study is to explore opportunities for learning embedded in a practice-based professional development that layers in the complexity of race. Gaining a better understanding of the professional learning space created by the EML offers insights into the tensions that observing educators must navigate when specific attention to race and equity are layered with attention to mathematical content and teaching practice.

In this chapter, I present findings related to my first research question:

1. What opportunities to learn were offered in the practice-based professional development structures surrounding "live instruction" to support participants to see the brilliance of Black children's mathematical thinking in practice?

In particular, I sought to understand what opportunities to learn (OTL) were afforded in the prebrief and debrief sessions that took place before and after live instruction each day. I focused my analysis on opportunities to learn that centered Black students' experiences, mathematical content, or teaching. My goal was to examine the opportunities that the EML afforded for educators to learn about mathematics instruction that is premised on the idea that Black children are brilliant and how participants took up those opportunities.

I begin by identifying and describing the OTL available within the prebrief and debrief, including an analysis of how much time facilitators spent engaging educators around the OTL. I identify three themes that capture the main foci of the OTL: *knowledge of Black students and their experiences, mathematical content,* and *knowledge of the teacher and teaching*. I describe

how each of these themes were present in the OTL available during prebrief and debrief. Lastly, I provide an example of how OTL were layered to encompass Black students' experiences, mathematical content, and teaching practice.

Opportunities to Learn to Notice

I begin by describing how the time was spent in the PD structures designed to support the observation of live teaching. It is important to note that in identifying the OTL available during the EML, I am not seeking to name what educators "actually" learned during the prebrief and debrief sessions. Instead, I use “opportunity to learn” here to investigate what was potentially available to learn, how it was made available, and how much time was allocated for learning (Berliner, 1978; Elliott, 2015; Kurz et al., 2014; F. I. Stevens, 1993). As such, my analysis of the OTL captures topics of discussion that surfaced in whole group during prebrief and debrief and that educators had the chance to take up and apply during their observations and analyses of live instruction.

I concluded that all three components of the instructional triangle were worked on during the prebrief and debrief sessions; I label these as themes. They are: (1*) knowledge of Black students and their experiences*, which includes explicit discussion of Black students and their experiences; (2) *mathematical content,* which includes discussion of mathematical content as it pertains to the work of teaching content; and (3) *knowledge of the teacher and teaching*, which includes explicit talk about the teacher and her teaching practices, teachers' ideological beliefs about students and learning, and their views about teaching. Themes appeared individually as well as simultaneously with one another at various points across the week. In the cases that themes appeared in the same time frame simultaneously, I coded for each theme that appeared. For example, during Tuesday’s prebrief session, the teacher discussed how Jierre’s mathematical

contribution at the board offset the notion that only students with correct answers should come to the board (Black students' experiences). The teacher also used his presentation at the board to highlight how mathematical explanations were more important than mathematical conclusions (mathematical content). So, this minute interval was coded for both themes. I discuss how themes were *layered* within OTL at the end of this chapter.

Overall Time Distribution

The participating educators were engaged for approximately five hours each day in study the work of teaching at the EML. This translates into 25 hours across the week, which was split about equally between watching live instruction and engaging in the prebrief, debrief, and afternoon workshops where they had opportunities to study the work of teaching. Participants spent approximately 12½ hours across the week observing live instruction. About 4½ hours were spent becoming familiar with lesson plans, doing mathematics problems, looking at students' notebooks, and transitioning between spaces. This analysis focuses on the remaining eight hours or so (469 minutes) in which the educators discussed the work of teaching in the prebrief and debrief sessions. This averages to about 48 minutes spent in each prebrief and debrief session.

Table 5-1 displays the percentage of minutes spent on each theme across the week. The percentage values for the three themes ranged from 36% coverage in minutes of *knowledge of Black students and their experiences* to 55% coverage in minutes of *knowledge of teacher and teaching*.

Table 5-1

Coverage of Content in Surrounding Structures

Theme	Proportion
Knowledge of Black students and their experiences	0.36
Mathematical content	0.40
Knowledge of teacher and teaching	0.55

Note. The table demonstrates the proportion of minutes covered in the prebrief and debrief sessions. The percentage adds up to more than 100 percent because of overlapping themes during time-intervals.

In the next sections I unpack each theme and provide detailed descriptions of topics covered in the prebrief and debrief sessions.

Black Students and Their Experiences

I divided the theme *knowledge of Black students and their experiences* into three categories: (a) capability and identity, (b) typical experiences in school, and (c) students' interactions. Each category was further broken down into specific aspects that provide finer-grained details about the different foci of prebrief and debrief discussions (see Table 5-2). For example, when the educators discussed how the teacher made public declarations that all students' answers were valuable, I coded this as *capability and identity* → *capability*. A discussion about the teacher's non-responses towards behavior was coded *typical experiences in school* → *discipline practices*. Table 5-2 also shows what percentage of time was spent on each aspect within the knowledge of Black students and their experiences theme.

Table 5-2

Coverage of Knowledge of Black Students and Their Experiences Theme

Theme	Category	Aspects	% of theme
Knowledge of Black students and their experiences (175)	Capability and identity	Agency and power	13%
		Rights as learners	10%
		Identity	10%
		Capability	10%
		Valuing students' voice	5%
		Presenting at the board	3%
	Typical experiences in school	Discipline practices	4%
		Seen by teachers	10%
		Reproducing inequities	1%
		Other experiences in school	3%
	Students' interactions	Engagement	6%
		Behavior	10%
		With teacher	7%
		With other students	14%

Note. Categories were only counted once if they appeared simultaneously in the same minute. Aspects did not appear simultaneously within the same minute.

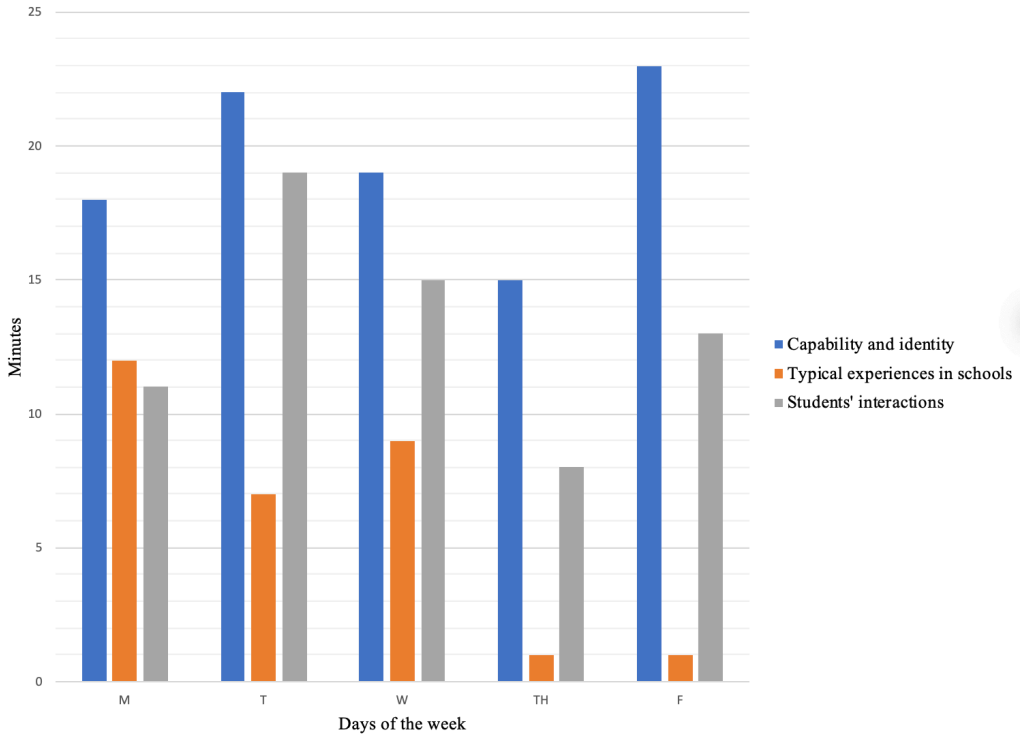
Time Distribution

As can be seen in Figure 5-1 below, there was a range across the week in terms of how much time was spent on each category of discussion topic. Each day there were at least 15

minutes of discussion about the capability and identity of Black students. This was not the case with the other two categories, which were discussed less consistently across the week. For a complete breakdown of how much time was spent on each category of discussion topic in the prebrief and debrief sessions, as well as more detail about the aspects that were coded within each category, see Appendix A.

Figure 5-1

Coverage of Knowledge of Black Students and Experiences Categories



Thematic Coverage

Within the category of *capability and identity*, I coded discussion for instances when educators and facilitators discussed Black students' agency and power, rights as learners, identities, capabilities, voice, and presentations at the board. Across the week there were opportunities for the educators to analyze each aspect, although some days yielded more

opportunities than others. Within the category of *typical experiences in school*, I coded for instances when educators and facilitators discussed the experiences of Black students and how those experiences were typically affected by the teachers' disciplinary practices, the teacher's interpretation of students, the reproduction of inequities in school, and other experiences within school. Across the week, the majority of the discussions within this category were about the teacher's disruptive disciplinary practices and her intentional work to position students as capable. Finally, I coded discussions as *student interactions* when educators and facilitators explicitly analyzed student's engagement levels, behavior, interactions with the teacher, and interactions with other students. Student interactions were mostly discussed within the context of students behavior across the week.

Summary of Findings

The prebrief and debrief discussions offered many opportunities to build awareness of the experiences of Black students throughout the week. Race was often taken up in these sessions in connection to students' typical experiences. Both the teacher and observing educators introduced ideas about Black students' typical experiences into discussions. When the teacher made contributions about Black students' typical experiences, they were usually in reference to her deliberate disruption of inequitable experiences and, in some cases, how that affected her in-the-moment decisions. When educators talked about Black students' typical experiences, they were either first-hand testimonies about what they had observed professionally in their own work or analyses of the EML teacher's moves that they noticed were disrupting patterns of inequity.

Mathematical Content

I divided the theme *mathematical content* into three distinct categories (see Table 5-3): (a) content and students, (b) content and teaching, and (c) content and curriculum. I further broke

down each category into specific aspects that provide finer-grained details about the different foci of the discussions. For example, when educators talked about a specific mathematical pattern that Brendan[5] had shared for the problem, "Make equations for 10," I coded this as *content and students → specific student thinking*. A discussion of transitioning from the definition of a fraction within the area model to the number line was coded as *content and curriculum → decomposing mathematical* space. Table 5-3 also shows what percentage of time was spent on each aspect from within the *mathematical content* theme.

Table 5-3

Coverage of the Mathematical Content Theme

Theme	Category	Aspects	% of theme
Mathematical content (189)	Content and students	Specific student thinking	48%
		Trends & experiences with content	9%
		Standards for mathematical practices	15%
	Content and teaching	Use of materials and manipulatives	5%
		Instructional support	7%
	Content and curriculum	Decomposing mathematical space	30%
		Unpacking core mathematical ideas	3%
		Common Core State Standards	1%
		Scope of curriculum for EML	5%

[5] A student in the EML.

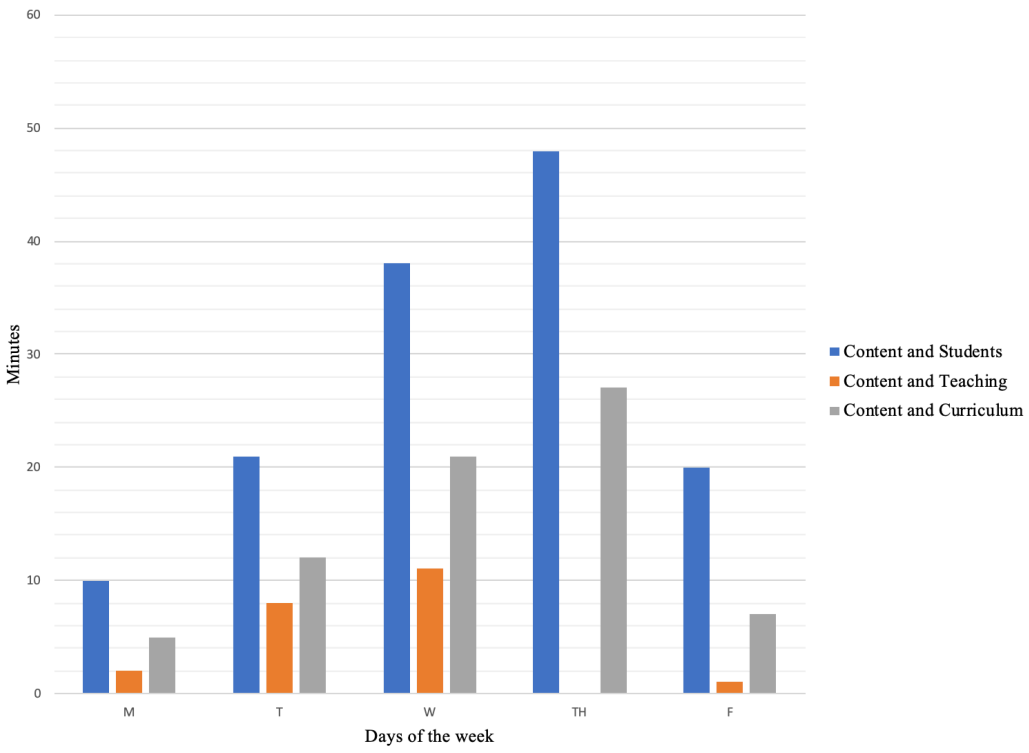
Note. Categories were only counted once if they appeared simultaneously in the same minute. Aspects did not appear simultaneously within the same minute.

Time Distribution

As can be seen in Figure 5-2, there was a range across the week in terms of how much time was spent on each category. Monday through Wednesday there was a steady increase in time spent on each category each day. However, on Thursday and Friday the data fluctuated considerably. For a complete breakdown of how much time was spent on each category in the prebrief and debrief sessions, as well as more detail about the aspects that were coded within each category see Appendix A.

Figure 5-2

Coverage of Mathematical Content Categories



Thematic Coverage

Within the category of content and students, I coded the collective discussion for instances when the educators and facilitators discussed specific student thinking, typical trends in student thinking and mathematical practices used by students. Figure 5-2 shows that during each of the five days, there were opportunities for educators to analyze the intersection between content and students, though the amount of time spent on content and students varied each day from 10 minutes on Monday to 48 minutes on Thursday. It is important to note that as the week progressed, the number of minutes spent discussing content and students increased daily, except for Friday. Friday's debrief was different from the rest of the week. Since this was the last day for most of the participating educators, half of the debrief was dedicated to hearing final thoughts about what they were taking away from attending the professional development. As a result, there was less time for the group to analyze the work of teaching, including mathematical content.

Within the second category of content and teaching I coded the collective discussion for instances when the educators and facilitators discussed the use of materials to support learning and instructional support given to students. Across the five days, there were not always opportunities for the participating educators to analyze these aspects of teaching and, on the days that these two aspects were discussed, they were only discussed for small amounts of time. However, there were two days in particular on which there was a surge in discourse about content and teaching. The first surge happened during the prebrief on Tuesday when educators discussed the use of materials and manipulatives to support students' conceptual understanding of fractions. The second surge took place on Wednesday during the debrief when the educators

discussed specific instructional support given to students as they developed vocabulary and explanations.

Within the third category, content and curriculum, codes capture higher-level discussions between the facilitators and educators about the mathematical curriculum of the EML. The aspects of this category included the work of decomposing mathematical tasks and mathematical spaces, analyzing teaching and learning, connecting mathematical problems to core mathematical ideas, mapping content to Common Core State Standards, and unpacking the scope and sequence of content across the EML. The majority of the codes in this category were in the aspect decomposing mathematical tasks. Facilitators spent a notable amount of time on supporting educators to understand the strategic nature of the mathematics and mathematical tasks chosen for the EML. Mathematical tasks feed into three major mathematical content areas covered during the week: (1) fractions; (2) number systems, operations, and algebraic foundations; and (3) combinatorics (see Figure 5-3). In addition to content, the EML mathematical territory also included mathematical practices, mathematical vocabulary and language, and practices for learning mathematics.

Figure 5-3

Mathematical Territory of the EML

Mathematical content	**Key mathematical concepts**	**Sample task**
Fractions	• The concept of "whole" • The concept of equal parts • Naming equal parts • Using basic definition of fractions to name and identify fractions	What fraction of the rectangle below is shaded gray? 
Number systems, operations and algebraic foundations,	• Identifying and verifying equations for ten • Addition and multiplication facts • Evaluate equations for whether they are true or false • Meaning of the equal sign • Write and interpret numerical expressions • Evaluate the equivalence of expressions.	Write equations for ten.
Combinatorics	• Permutations	How many different three-digit numbers can you make using the digits 4, 5, and 6, and using each digit only once?

Summary of Findings

The opportunities to focus on mathematical content enabled educators to focus on the ways the teacher supported Black students' engagement with content as well to develop their own knowledge of the content, including pedagogical content knowledge. Because the work on mathematics content was typically done from a teacher's perspective (e.g., how a teacher might

introduce a piece of content) and was embedded in discussions of how the Black students of the EML responded to it, opportunities to learn about mathematical content opened space for educators to engage directly with the complexities of teaching content in ways that attend explicitly to students' racialized identities and experiences.

Teacher and Teaching

I divided the theme *knowledge of the teacher and teaching* into three distinct categories that can be seen in Table 5-4: (a) disposition, (b) planning and design considerations, and (c) practices that disrupt patterns of inequity. Each category was further broken down into specific aspects that provide finer-grained details about the different foci of the discussions. For example, when the teacher shared that while leaving comments on students' homework she thinks about whom she is writing to and making sure that her comments are not wrapped up in gender and racial bias, I coded this as *disposition → disrupting inequitable practices*. A discussion about how the teacher controlled her tone of voice and kept it the same no matter what students said in order to avoid privileging one student's contribution over another's was coded as *practices that disrupt patterns of inequity → physical presence*. Table 5-4 also shows what percentage of time was spent on each aspect within the *knowledge of teacher and teaching theme*.

Table 5-4

Coverage of Knowledge of Teacher and Teaching Theme

Theme	Category	Aspects	% of theme
Knowledge of teacher and teaching (261)	Disposition	Professional experiences	8%
		Cultural, social and political development	3%
		Commitment to children and their families	6%
		Disrupting inequitable practices	11%
		Learning is constructive	2%
	Planning and design considerations	Lesson plan design & learning goals	38%
		Classroom environment & physical space	10%
		Instructional decisions while teaching	17%
	Practices that disrupt patterns of inequity	Building trust and developing relationships	8%
		Having high expectations	2%
		Norms & routines for discourse	3%
		Physical presence	1%
		Maintaining a focus on content	2%
		Assigning competence	3%
		Interrupting punishment practices	6%
		Discussion leading practices	2%

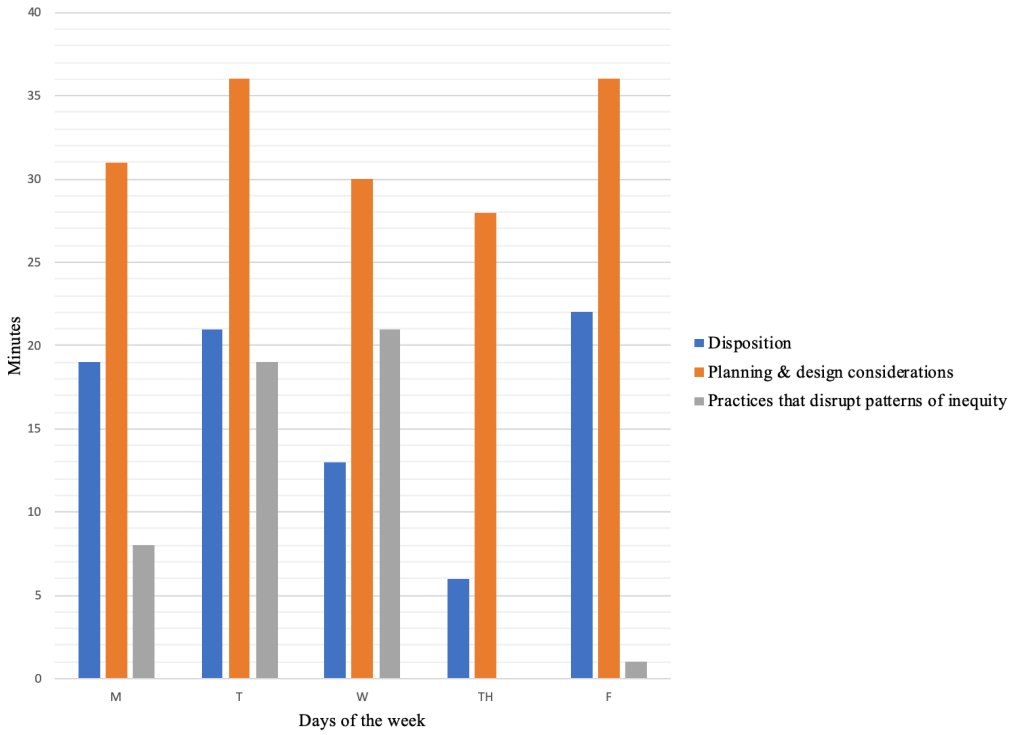
Note. Categories were only counted once if they appeared simultaneously in the same minute. Aspects did not appear simultaneously within the same minute.

Time Distribution

As can be seen in Figure 5-4, there was a range across the week in terms of how much time was spent on each category. The teacher and facilitator created many opportunities each day for educators to learn about the teacher's disposition towards Black students and her ideologies about teaching and learning in general. Even though the teacher was consistently transparent about her disposition, the majority of the discussions within this theme were spent on unpacking the teacher's planning and design considerations. Each day there were at least 28 minutes dedicated to this category. The least amount of time was spent on practices that disrupt patterns of inequity. For a complete breakdown of how much time was spent on each category in the prebrief and debrief sessions as well as more detail about the aspects that were coded within each category see Appendix A.

Figure 5-4

Coverage of Knowledge of Teacher and Teaching



Thematic Coverage

Within the disposition category, I coded discussions for instances when educators and facilitators discussed the teacher's professional experiences; ideologies around classrooms being a space for cultural, social, and political development' commitment to children and their families; practices for disrupting inequities; and belief that learning is constructive. Figure 5-4 shows that participants spent the greatest amount of time discussing the teacher's disposition on Monday, Tuesday, and Friday. The teacher's move to bookend the week in this way allowed her to provide insight into her disposition in order to frame the work educators analyzed.

Within the category of planning and design considerations, I found that more of these discussions took place during the prebrief sessions, although the debriefs still included a considerable amount of time on this topic. The prebrief provided an opportunity for facilitators to support educators to understand the lesson plan before it was implemented. Figure 5-4 above shows that within the larger theme, planning and design considerations were coded more times than the other two categories. Moreover, planning and design has the highest number of codes (n=161) out of all the categories across the three themes.

Within the category practices that disrupt patterns of inequity, I coded for instances when educators and facilitators discussed specific moves the teacher made to intentionally disrupt patterns of inequities that impact Black students in schools. Most of these discussions considered the teacher's moves to build trust and develop relationships (see Table 5-4). Most of the minute increments for this aspect (building trust) occurred on the first day during debrief. For instance, in the second minute of the debrief on day one, the teacher shared with educators that she was actively working to cultivate trust between the students and herself. She stated that one thing she worried about was how students viewed her as a White teacher and that she was trying to understand how the children saw her. She acknowledged that they were in a White space and wanted to be sensitive to how students might see her and what sense they made of her and of the EML.

Summary of Findings

The prebrief and debrief discussions offered many opportunities for educators to gain access into the, often implicit, thought process of the teacher. The discussions worked to expose why the teacher made certain decisions about her choices in tasks, sequencing of ideas, and in-the-moment decisions that supported students' development of concepts. The opportunities to

focus on the teacher also provided educators with access into the teacher's ideological stances, which served to fill in any gaps educators may have had in fully understanding what was driving some of her decisions. Without these opportunities, educators would have had to carry the burden of filling in these gaps for themselves. Whatever narrative they created would have solely stemmed from their own professional and personal experiences.

Summary of Opportunities to Learn

Taken together, the three themes illustrate the ways that the EML teacher and facilitator opened up space for educators to consider the experiences of Black children, to decompose mathematics content as it relates to teaching that content, and to analyze instruction and teaching practice that might disrupt inequality. In the remainder of this chapter, I examine the ways that the teacher and facilitator layered work around these themes during the prebrief and debrief sessions to engage educator the full complexity of analyzing and learning from live instruction.

Layering Opportunities to Learn

Although I have so far described opportunities to learn as if they were more or less separate from one another, in reality the EML teacher and facilitators designed the prebrief and debrief sessions to intentionally *layer* attention to Black children's experiences, mathematical content, and teaching practice. I define *layering* in PBPD as using concrete activities (e.g., analyzing student notebooks) to intertwine work on disrupting patterns of racism in schools with work on particular content and work on specific aspects of teaching practice (D. L. Ball & Willis, 2018). The EML teacher and facilitators used this technique to foreground specific features of instruction and showcase how they inform the other components of instruction.

In this section, I unpack an example of layering opportunities to learn as it unfolded on the first day of the EML. I begin by describing what happened during the prebrief and live

instruction on Monday and provide a snapshot from the debrief discussion of an instance in which the teacher and facilitator layer opportunities to learn. I then analyze how they layered attention to mathematical content with Black children's experiences and with teaching practice in this snapshot. I conclude the chapter with a discussion of the importance of layering in PBPD.

Monday

The first day of the EML each year is full of excitement. When one enters into the space there is always a low buzz in room from educators arriving, getting materials, mingling, eating breakfast, and settling into their seats. When the facilitator and teacher enter into the room, start educators begin to shift in their seats, some begin to lean ever so slightly forward with excitement, and the low buzz becomes complete silence. The educators are excited, they are curious, and they are in eager to engage in a professional learning community.

Prebrief

The teacher and facilitator used the first prebrief discussion to frame both the children and the mathematics educators would observe during live instruction. After the facilitator welcomed the group and allowed the participants to review the lesson plan for the day, the teacher stood in front of the observing educators and launched Monday's prebrief by stating that this group would use its time together to analyze instruction of Black students in mathematics. She told educators that the children's experiences in school should not be taken for granted or overlooked, and she laid out the essential premises on which their analyses of the children's work during the EML should rest:

> These are children about whom many people don’t have positive expectations, don’t see them as capable, often get distracted by things that are really unworthy of being paid attention to, and say things about them that make them seem like they are not capable.

> We are putting on display the very children that are often marginalized in our society. Our goal here is to see things that most people are not seeing or many people in our society fail to see. We are seeing their capability, we are seeing how smart they are, we are thinking about the conditions that enable them to do that and use that smartness. So please think a lot about what you see in your own professional experience about the ways in which children of color are often marginalized by literally being excluded from class for behavior by having their ideas not attended to or valued, not being encouraged to do complicated work. So please remember that background of the history of our country and what goes on every day and think about how we can use this environment to all learn to be disrupting that.

The teacher made two moves during this introduction that began to layer educators' opportunities to learn. First, she acknowledged the racialized sociocultural context of instruction and of the PBPD itself by calling out how Black students are typically treated by teachers and schools. Second, she underscored the importance of disrupting those inequities by sharing with educators the goals she had for how they should view the students.

A few minutes later, the teacher introduced fractions as the content that students would be working that day. She shared four key reasons why she chose fractions as part of the mathematical content to cover during the live instruction:

- Fractions are high-leverage content that also serve as a gateway to more advanced mathematics, including serving as a basis for Algebra.
- Fractions are hard to teach well.
- Fractions are not easy for students to learn.

- Fractions are often the source of unnoticed misunderstandings that plague children in mathematics in later grades.

Further, because many adults struggle with fractions (both understanding them and teaching them), focusing on this content opened opportunities for teachers to analyze the mathematics for themselves at the same time as they examined instructional practices.

Live Instruction

During live instruction, the teacher facilitated a discussion around the *gray rectangle problem* (see Figure 5-5 below). The gray rectangle problem was designed to support students in naming the whole, naming equal parts, and naming the unit fraction. It was also strategically designed to illuminate for educators trends in student thinking about fractions that result in misconceptions. For example, students are inclined to name the shaded area "one-third" because they see three boxes total and one shaded box. This is a common misconception for students at the beginning of the trajectory for naming fractions because they may not yet have learned the importance of identifying *equal* parts when naming fractions. The design of the task forces students to consider, identify, and create equal parts in order to accurately name the fraction. If students are always given equally-partitioned area models, they may never explicitly realize the necessity of equal parts which will have implications for their ability to do more advanced work with fractions such as placing fractions on a number line.

After giving students several minutes to work on the *gray rectangle problem* on their own, the teacher launched the discussion by asking if anyone wanted to share their solution. The first student to volunteer was J[6], a Black boy. He said, “There are three squares and one of them is shaded in so that equals one-third.” After ensuring that the class understood J's reasoning, but

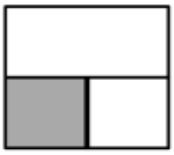
[6] The student’s name was Jierre, but he asked the teacher and class to call him “J”.

without commenting on whether it was right or wrong, the teacher asked the class, “Does anyone else have a different answer?” Kiahn, another Black boy, responded that he had one-fourth. The teacher invited Kiahn to the board to share his thinking with the class. His explanation was simply, “You have to split the longer rectangle.” Figure 5-5 contains a transcript of what happened after Kiahn’s explanation.

Figure 5-5

Transcript from Monday’s Live Instruction About the Gray Rectangle Problem

What fraction of the rectangle below is shaded gray?



Teacher:	What word can we use to describe what Kiahn did? He split the rectangle but noticed something about the drawing before he put the line in. What can you say about this shape (points to the top rectangle) and these two (points to the bottom two squares)? What is different about them?
DT:	The one at the top is bigger than the other ones.
Teacher:	So, can you explain what he did when he put the line in? what did he do about the size? How did he change the size?
DT:	He equaled them.
Teacher:	Excellent, that word that DT said is the most important word. Can you say it one more time?
DT:	Equal.
Teacher:	He made them equal. When you name a fraction, you have to worry about if all the parts are equal. Once you put the line in then, they are all equal. In order to figure out the fraction, they all have to be equal.

This moment from the live instruction created potential opportunities for educators to notice interactions between two components of the instructional triangle: teaching practice and

student thinking. The notion of equal parts was collectively constructed by DT and his classmates. DT's classmates did the work of showing that there were four parts and introduced the idea that they could split an unequally partitioned rectangle. DT formalized the idea when he introduced the language "equaled." There was potential in this moment for educators to notice how area models create space to surface misconceptions that students may have about fractions. This moment also offered an opportunity to notice the teacher's moves to foreground Black children's sensemaking in the ways she engaged the class with both Kiahn's and DT's thinking.

Debrief

I have pulled out all of the comments educators made during Monday's debrief that were directly related to the short exchange between the teacher and DT around the mathematical concept of "equal parts." The snapshot below (Figure 5-6) is one illustration of how opportunities to learn were layered so that educators could discuss mathematical content in ways that enabled them to deepen their pedagogical content knowledge and consider the power dynamics of language as they relate to Black children's capability and identity.

Figure 5-6

Snapshot: DT's Idea

Teacher:	They did seem to do that fraction work and make some headway with it, and begin to see what it would feel like to revoice someone else's idea and comment on it, and the idea of equal parts is at least seeded. I wouldn't say it is settled but it is seeded. We didn't talk about the "whole." The notion of "equal" was said by DT and that was important.
Educator 1:	There was something about the kids' development of language that they don't have yet. The teacher was asking why did you put the line there. DT said he "equaled them." So, it was an interesting piece of language that got formalized. It was interesting that he invented an expression to say what he was doing.
Facilitator:	What do you think the teacher's revoicing did in that situation to support relationships and safety in the classroom?
Educator 2:	When it came to the discussion about the fraction, the teacher waited out the "equal" to come. The teacher didn't give them the word, he said "equal," he created it and it gave that sense of ownership and we are building it together.
Educator 3:	The teacher dignified his answer and then right away gave the correct term.
Educator 1:	In the compact, it spoke about the children making mathematics. I was wondering what the kids might think of that. An example is the discussion of equal parts and the rectangles was a place where the students seemed to be making the mathematics that was on the agenda.
Teacher:	Your point about how different language gets used. The idea of "equal" as a transitive verb is lovely. You can equal something. As in you "equaled" a rectangle is lovely. It will come up because one of the parts of the definition of a fraction is the thing divided into equal parts. If it isn't, make them equal. It will be a real opportunity to revisit. The fact DT had this idea, that it is a verb, and you make things equal. It connects the making of mathematics.

Note. The debrief was one hour long. Debrief discussions were not always linear. Here, I have pulled out all of the comments that were directly related to the concept of "equal," although they did not occur in sequential turns of talk.

Foregrounding Mathematics and Layering Black Students' Explanations

In this snapshot, the educators had an opportunity to think more deeply about what is involved in both honoring student language and supporting students to continue to develop precise mathematical concepts. Teachers' responses to Black students' mathematical ideas are often racialized in the way they treat Black students' language. One way teachers might talk about Black students' language is to focus on whether it is "academic" or not. Teachers who

adopt this stance might well overlook both Kiahn's and DT's contributions because neither boy uses the "correct" term. This stance is preoccupied with prioritizing talking correctly, instead of listening for key mathematical ideas in what students are saying. Another stance teachers might take is to say that it is important to respect any language that students use to describe mathematics the way that students see fit. This stance is superficially wrapped up in the idea of respecting students as sense-makers. However, it can easily become a perverse rationale for lowering the bar of mathematical learning for Black students because teachers who adopt this stance run the risk of accepting anything that a child says as long as it is within the ballpark of mathematical accuracy.

For example, a teacher who accepts any language that children offer might rationalize that the word “split” is sufficient as long as the teacher knows what Kiahn meant by it. But teachers who simply accept students' language may misinterpret students' actual understanding. Do Kiahn and his peers know what they mean when he says “split”? Does that word accurately encompass the mathematical concept that the class is working on? Are there possible misunderstandings that could arise if the teacher fails to interrogate this informal term? How would the teacher know truly if Kiahn understood the underlying mathematical ideas if she accepted "split" as the final answer and moved on under the assumption that the mathematical precision and accuracy of “making parts equal” is embedded in the verb “split”—and that all of the students in the class understood that?

Instead of stopping the discussion at the verb “split,” the teacher continued to elicit students’ thinking because the mathematical point here is equal partitioning, and that was not made clear by the verb “split.” In this case, educators were able to see the teacher leverage her pedagogical content knowledge by listening for the mathematical concept of equal parts.

Furthermore, when DT said “equaled” he contributed a significant mathematical idea to the discussion, showcasing his brilliance. He would not have had the chance to do so if the teacher had simply accepted Kiahn's term and moved on.

In the snapshot of the debrief discussion about DT's idea, the teacher makes moves to layer opportunities to learn about what happened in class. First, she explicitly points out for educators that DT’s notion of “equal” was an important contribution, publicly acknowledging his competence. Educators agreed with the teacher and pointed out that the teacher’s questioning played a role in DT’s important contribution. Educator 1 highlighted that the teacher’s question of “Why did Kiahn put the line there?” was the scaffolding DT needed to make the connection that Kiahn was, in fact, trying to make two equal squares. The teacher’s move in the debrief to name DT’s contribution as important constitutes layering because she is calling educators’ attention to DT’s brilliance as it is embedded in the educators’ rich discussion of the mathematical content and the teacher’s discussion leading moves.

Finally, the teacher noted that the idea of equal parts was only “seeded.” In other words, it had been introduced but not yet completely expanded and owned by the class. This move added to the layering work already evident within this snapshot because it signaled to educators that the students would continue working on this content. It also positioned educators to continue attending to the teacher's practice around supporting students to develop conceptual understandings of “equal parts,” “whole,” and the language of naming a fraction. Educators are now positioned to continue to reflect on how Black students' explanations are essential resources for instruction.

Foregrounding Mathematics and Layering Teaching Practice

The facilitator contributed to layering opportunities to learn in the above snapshot when she prompted educators to consider the connection between the teacher's instructional move of revoicing and the work of building relationships with students. Up until this point, the discussion was focused on DT's key contribution to the class. The facilitator's question about revoicing prompted educators to attend to different aspects of practice. It was at this point that educators began to consider the implications for allowing important mathematical ideas to come first from students rather than the teacher, the one who is generally seen as the authority on content. One way teacher's may have responded to Kiahn's explanation would have been to respond with "what I think you are saying" and restate Kiahn's idea using academic language. Teachers who revoice students' developing ideas with their more completed and formal ideas are more concerned with students attaching themselves to misconceptions, instead of supporting them to get to the key mathematical ideas organically. It was only after the key mathematical idea was surfaced by DT, that the teacher then implemented the popular teacher move of revoicing, not before.

The facilitator's prompt constitutes layering because it allowed educators the opportunity to consider more than one facet of the work of teaching at a time. In this case they were considering the implications of instituting the seemingly small move of revoicing before or after the key mathematical idea surfaced for students. The prompt also layered in opportunities for educators to reflect on their power and authority as it pertains to mathematical knowledge. Is the teacher the keeper and giver of knowledge? Or does the class make knowledge together? The teacher did not evoke her authority and power by giving the students the formal language, but

instead, supported students through a serious of questions and moves to support them to do that work.

Summary

The snapshot represents one of many layered opportunities to learn that the teacher and the facilitator offered to educators throughout the week. These opportunities created openings for educators to notice and analyze multiple facets of the teaching and learning of mathematics simultaneously. In particular, they opened spaces for educators to analyze and discuss Black students' experiences, mathematical content, and teaching practice and the ways that those features of mathematics instruction are intertwined. In the next chapter, I will consider how educators took up the opportunities to learn that they were offered by analyzing whether and how they were able to notice the brilliance of a particular Black girl in the class, Kenya.

Chapter 6
Participants' Perspectives

The previous chapter examined the surrounding structures, prebrief and debrief sessions, to identify opportunities to learn that supported educators in seeing the brilliance of Black students' thinking. The chapter has a description of the approaches used to support educators to see the brilliance of Black students through their opportunities to work on mathematics, practice the work of teaching, and to learn about the typical experiences of Black students in school. This chapter is about the sense that the educators made of Kenya given the opportunities to learn that they had. The responses that participants made about Kenya are being used as an example of how participants responded to Black children in the class more generally.

Meet Kenya

Kenya was a Black girl who educators noticed and talked about regularly during the prebrief and debrief sessions. She was mentioned by name during every single session except for the Monday morning prebrief. In fact, discussion about Kenya accounted for 15%[7] of one-minute increments in which educators talked about students by name. It was clear both at the time and in looking back at the data that the observing educators watched her very closely across the week.

We first met Kenya at the beginning of live instruction on the first day of the EML. The teacher asked students to pair up and introduce their partner to the class. Kenya and her partner, Star (Figure 6-1), were seated at the very end of the U-shaped arrangement of desks, which

[7] There were 138 one-minute increments in which student(s) were discussed by name. Twenty-one of those increments were about Kenya.

meant that they were the last pair to present. When it was their turn, they both stood up. Star introduced Kenya by saying, “This is Kenya she likes to sleep.” Kenya introduced Star by saying, “This is Star she likes to sing and dance.”

Figure 6-1

Kenya and Star Introducing Themselves on the First Day of Class

Note. Kenya is standing on the right. Star is standing next to her.

Kenya's voice was soft and often came out as a fast whisper, but she was very straightforward and to-the-point with her contributions. She was honest about how she was feeling, and she seemed clear about what she knew. Throughout the week, she often seemed eager to participate. It was normal to see her hand shoot up to answer questions from the teacher, and she was not afraid to offer answers that were different than her peers. On two separate occasions her contributions to the class were so nuanced and sophisticated that they caught the

attention of the educators and became points of discussion in debrief. In the first instance the teacher asked students on Monday how many number sentences for 10 are there. Kenya responded, as many as the universe. At this point *"infinity"* had not been surfaced yet in class so this was her way of describing what she did not have the language for at the time. Then, on Wednesday, while the teacher was leading a discussion around the minicomputer task seen in Figure 6-2, she asked "is every number from 2 – 16 possible?"

Figure 6-2

Minicomputer Task

You have two checkers. You have to use both of them.
What is the smallest number you can make? The largest? What numbers in between are possible?

The ones board of the minicomputer
One checker on the white square = 1 x 1
One checker on the red square = 1 x 2
One checker on the purple square = 1 x 4
One checker on the brown square = 1 x 8

Kenya responded "you can't make some of the number because they are odd numbers. For example, I can't make 7 because that is an odd number." She then explains her reasoning by making a conjecture that this is so because we can only use two checkers and because there are not any odd numbers on the minicomputer. Educators were impressed because Kenya was starting develop a general theorem about why some numbers can be made with two checker and others could not be made.

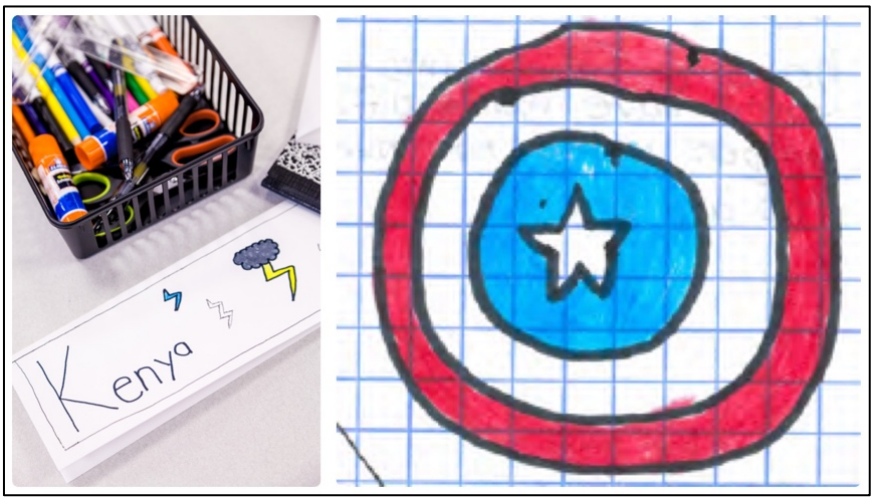
Her notebook was another place that her active participation in class was evident. She recorded her work diligently. She also wrote notes to herself in her notebook that provided some insight to what she was thinking about during the week. For example, she wrote:

- “My goal for myself is to raise my hand for questions and concerns” (Notebook, Tuesday, p. 8)
- “I persevered [today] by knowing my math facts” (Notebook, Wednesday, p. 15)
- “I will listen and learn from my classmates, I’ll also learn from my mistakes” (Notebook, Thursday, p. 22)

In addition, her notebook (and her name plate) indicate that she liked to draw (Figure 6-2). The notebook was filled with doodles of lightning bolts, palm trees, and Captain America’s shield.

Figure 6-3

Example of Kenya's Art



Note. Kenya's name plate (left) and a drawing from her notebook (right).

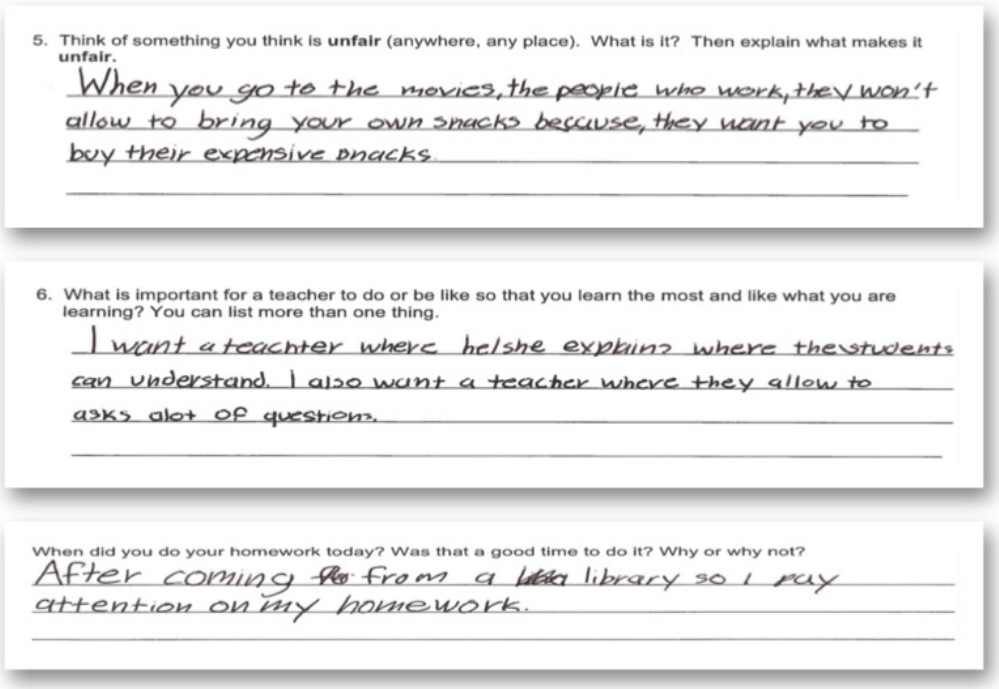
Her notebook also offers evidence that the teacher valued Kenya's ideas and presence in the class. The teacher left comments in her notebook like:

- “Your notebook is so careful and complete! I loved your comment that the number of equations is “more than the Universe.” I hope you’ll continue to contribute to class today.” (Notebook, Pg. 11)
- “You did an awesome job in your math notebook! I loved your predictions on page 1. You also contributed really well to our class discussions” (Notebook, Pg. 6)

Lastly, Kenya’s homework offers nonacademic insights into her personality. For example, in the top example in Figure 6-3 below, she recognizes how movie theaters upcharge on snacks and try to force patrons to purchase them by not allowing any alternative options during a show. She thinks this situation is unfair. In the middle example, she expresses her desire to have a teacher who explains mathematics in ways that students can understand and who allows students to ask questions. This comment suggests that these aren’t normal teaching practices that she experiences in her school. This comment also suggests that she is serious about learning because she desires the teacher's support as well as the right to direct her own learning through questioning. The bottom example gives an idea where she spends some of her time outside of school. She apparently goes to the library in the afternoon before going home to do her homework.

Figure 6-4

Examples of Kenya's Homework Responses



This is just a glimpse into Kenya. It does not in any way capture the fullness of her: Her joy. Her laughter. Her play. Her caring spirit toward her classmates. Her enthusiasm about math or the way her eyes got big when the teacher presented a new problem. The intensity she exuded when she was concentrating on her work.

In the remainder of this chapter, I unpack the ways the focal educators noticed and interpreted Kenya in prebrief and debrief discussions, interviews, and digital logs and what this indicates about how the PBPD supported educators, or not, to see Black children's brilliance. My intentions are to simply provide a brief glimpse into who she is before presenting how participants shared their perspectives.

Participant Profiles

I will briefly introduce each participant. Each participant profile follows the same outline: (a) description of identity and professional experience, (b) description of focus during the daily live instructions, (c) general observations made in logs, (d) observations specifically about children, and (e) observations about Kenya. These profiles are limited and in no way complete description of the complex individuals who participated in this study. These profiles are merely an attempt to introduce each participant to understand better what they were taking up in the opportunities to learn. Table 6-1 is a summary overview of focal participants, their roles as educators, and the general focus of their observations as reflected in their daily logs and interviews.

Table 6-1

Brief Description of Participants

Participant	Role	Focus
Ben	Special Ed Teacher	Behavior
Hally	Teacher educator	What students were doing with math, and fraction work
Carmen	Math coach	Disrupting inequity, purposeful questions, classroom management
Elyn	Teacher	Behavior, social justice conversations, intentional teacher moves
Merissa	Math coach	Questions, math task, social justice

Ben

Ben identified himself as a White man who had 29 years of teaching experience. Ben presented as a light-hearted educator who did not shy away from making jokes, sometimes at his own expense. He was an engaged participant and contributed to the prebrief and debrief discussions on multiple occasions. Ben, a special education resource teacher, worked with upper elementary grade students, and, due to the demographics of his own students, he came to the EML with a great deal of professional experience working with Black children in schools. Of the EML students he said, "These are exactly the students I deal with." He described himself as open-minded but admitted that he had limited views on social justice in mathematics before attending the PD:

> I never thought of the ideas of social justice in math, other than figuring, hey math is a universal language that could, I suppose, unite people regardless of whatever other things divide them. So, I'm hoping I was already open enough before I came that I didn't need a whole lot of tweaking in that department.

In general, Ben focused on the teacher's management style and what techniques she was using for mathematical instruction. Ben felt it was essential to focus on behavior because from his own experience as a teacher he knew how much behavior dominated instructional time:

> I find behavior can dominate so much of a classroom that it becomes important even though you don't want it to. So, that's why that was interesting and revealed in a lot of my comments. I was looking at how people were responding and what they were doing and what [the teacher's] response to them was. And I saw her move of just positioning herself close to… I guess you might call it trouble or hot spots. And if she needed to just put a

light arm on the shoulder or something to try to draw them back in without saying a word. So, I did notice some of those techniques.

In his daily logs, 90% of Ben's recorded observations about students were about behavior (mostly about students' engagement and involvement, or lack thereof), and only 10 % were about student thinking or capability. This is also reflected in how he observed Kenya. He wrote about her levels of engagement, her smile (which he also commented on about other students), and how well she did or didn't participate with others in the class.

Hally

Hally identified as a White woman who had been an educator for many years; however, she indicated zero years of experience on the participant survey because she was a high school science teacher, not a mathematics teacher.[8] Hally, a teacher education professor, was attending this EML for the second time; her first time was two years prior in 2015.

In general, Hally focused on what students did and what they expressed mathematically. She admitted that this type of viewing was not natural for her because she was accustomed to watching behaviors when she observed pre-service teachers:

> I do a lot of observation in student-teaching classrooms. I find myself just being a note-taker and an identifier by blocks of time. In reflecting on all the conversations we've had this week, both in the prebrief, the debrief, and then actually watching, I have reflected to say that I'm really a behavior watcher, not a big-picture watcher or a content watcher. So, I really had to break myself of that habit this week. The [observation] tool itself helped me focus on students and what they were able to do. I think at the beginning of the week,

[8] The survey asked how many years participants taught mathematics.

> I was doing much more behavior and then I tried to really break myself free of that, and only write what was really interesting to me.

She also had a personal interest in fraction content, and she was watching closely how the teacher introduced and worked through the definition of a fraction. She said:

> I'm really interested in fractions work with pre-service teachers. So that's also another sort of filter that I'm looking through. I want to come up with the steps of naming a fraction, and changing them into questions.

Hally's observations of students in her daily logs skewed more positively about both student thinking and behavior than other participants(?). This is also reflected in how she observed Kenya. Her first impression of Kenya was that she seemed resistant to math, but she began to realize by Tuesday that was not the case.

Carmen

Carmen identified herself as a biracial woman who had 14 years of teaching experience. Carmen, a mathematics coach at a K-5 elementary school, worked with children, but a large part of her job was to support teachers by facilitating professional development and modeling teaching. Carmen eagerly participated in all the discussions and often highlighted for the larger group when she noticed the teacher disrupting inequities.

In general, Carmen focused on tracking how the teacher was intentionally disrupting social injustice through her use of purposeful questions and managing behavior in the classroom. Carmen stated:

> Well, the social justice piece, I have recently developed an incredible passion for. This idea of either disrupting or reproducing social justice has just been at the forefront of my mind. And I was hungering to see what this is going to look like in the classroom.

In her daily logs, 34% of Carmen's observations of the children of the EML were about students' thinking and capability. The remaining 66% of her observations were about students' behavior. This is also reflected in how she observed Kenya. She watched Kenya closely for both how she was developing number sense and how well she worked well with others.

Elyn

Elyn identified as a White woman who had 15 years of teaching experience. Elyn, a kindergarten teacher, also brought a good deal of professional experience working with Black children: “My class percentages are usually much higher of darker-skinned children. Whether they are African American, whether they’re Latino, whether they’re whatever, my population actually looks more marginalized just looking at them.”

In general, Elyn focused on social justice conversations, the intentionality behind the teacher’s moves, and her struggles with the teacher’s behavior management style. She reported, "First and foremost, the behavior management was very, very different than what I'm accustomed to seeing or doing. That in itself was a very big observation. One that I struggled with, in all honesty."

When Elyn recorded observations of students in her daily logs, 63% of her observations were about students’ behavior and most of those were to identify something negative about students’ behavior. She used words like "disrespecting," "chaos," and "escalating" to describe some of their actions. This is not reflected in how she wrote about Kenya in her logs. In fact, she only made one written observation about Kenya having a true understanding of balancing equations.

Merissa

Merissa identified as a White woman who had 14 years of teaching experience. Merissa, a K – 2nd grade mathematics coach, supports teachers in developing their mathematics instruction. It was clear that Merissa had experience observing teaching; she often provided evidence to support her claims.

In general, Merissa focused on teacher questions and mathematical tasks, but even that shifted across the week:

> I was trying to focus on the moves that the teacher did. So, some of the non-responses. Like when she didn't respond to certain behaviors. And then what were some of the things that she did that elicited different student engagements. I came in planning to focus on the questions, and the math task, and then the whole social justice piece really stood out and being intentional about making math accessible. I didn't want to [focus on] a lot of students' behaviors that didn't seem like that was the point. And it felt like I would lose focus on the math and the creating of social groups that learn together.

Merissa's observations of the children of the EML mostly focused on students' thinking and ability. This is also reflected in what she observed about Kenya. She made note of the ways that Kenya grappled with the scope of infinity and made mathematical conjectures. She also made note of Kenya's excitement to work on mathematical tasks that were novel to her.

Seeing the Brilliance of Black Students?

There were many opportunities for participants to learn to notice Kenya. Both the facilitators and educators surfaced these opportunities during discussions about students' thinking or analysis of teacher moves. Table 6-2 below showcases all of the opportunities to learn about Kenya across the week. The facilitator and the teacher made specific efforts to focus

educators' attention on Kenya's mathematical thinking. This can be seen, for example, on Tuesday, when the teacher highlighted Kenya's answer for how many equations for 10 she thought there were. The teacher also highlighted instances when Kenya stated she was learning from her classmates, as well as instances when other students stated that they were learning from Kenya. In addition, on Thursday an educator expressed how she was learning from Kenya's thinking. Finally, there were several instances in which educators turned their attention towards Kenya's notebook. In each instance in the table below, Kenya is celebrated as contributing to the class with her mathematical ideas. Across the week, the teacher repeatedly affirms that she sees and acknowledges Kenya's brilliance and presence in the classroom.

Table 6-2

Opportunities to Learn to Notice Kenya

Tuesday	Wednesday	Thursday	Friday
• (T)[9] Two people who I thought were interesting were **Kenya who wrote "the universe**" and Nadira wrote the last number there is. • Educators **discussed Kenya's solution to a fraction problem**. The educators were curious if her thinking was typical way of thing about the math for students. The discussion evolved into an opportunity to provide details about trends in students thinking and what mathematical ideas are embedded inside of the task • (E) Kenya had her head down in class and the teacher "instead of asking her directly to put her head up, said she'd like to show her something but she'd need to look up to see it" was the	• (T) "the children's writing is all different levels of neatness. And I was thinking how this relates to our learning to be self-conscious about our preferences about behavior. I just wonder how self-conscious some of us are that we prefer neater papers. **Kenya writes the most amazingly neat notes. They look like something out of a handwriting book.** But there are people who are writing very articulate and are missing commas and hard to figure out a word but the depth of their thinking is amazing. I wonder how much it interferes with our own reading?" • (T) some people wrote that they **learned about the equations going on forever from what Kenya shared**.	• (E) I was trying to make a general theorem that works for all of them and I feel like I can do that for 7, 11, 13, 15, **and going off what Kenya was saying** odd numbers and those odd numbers. In particular • Kenya wrote in her end of class check…**what did you do best today…."not going off on people".** • Teacher shared Kenya's end of class check with the group **"I was listening and learning from Akeelah"** • (E) KC 's notebook: **I noticed how the importance of learning from others grew throughout the week**.	• (T) **Akeelah wanted to work with Kenya.** They both wrote that it was successful for them • (E) **Presented multiple times and kept paying careful attention to her thinking** in a loud voice. • (T) **Kenya has been complex for you to see.** I think there are some things that are so visible and some other things that are not as visible she may be a harder to learn by watching.

[9] (T) represents a comment made by the teacher and (E) represents a comment made by an educator

teacher approaching Kenya with positive assumptions	There are sources of learning from other children. • (E) Kenya seemed to have a **powerful intuition about the oddness of 7** being obstacle. • (T) **Kenya has a lot more than an intuition,** she is almost on it she has given you a big clue if you don't know how to prove it. • Zack, Kenya, and Traci **are on to something when they were thinking about the odd number.**	

The week after the EML, I interviewed each participant about their experiences during the PBPD as well as their thoughts about racial equity, mathematics instruction, and teaching practice more generally. Based on their responses, it was clear that they were aware of the fact that Black students are often perceived and positioned negatively in classrooms based on physical features or appearance. In particular, I asked them to talk about how "other educators" might interpret the students in the EML. Throughout their responses, participants offered a variety of justifications for these "others'" views and surfaced common racial narratives concerning Black children's ability to learn and be taught complex content.

"Others'" Views of Black Students

I began each interview by asking participants, *"If 'other' educators visited a classroom—not us, but 'other' educators—visited a classroom with similar demographics to the EML, what do you think these educators might typically see or say about the children?"* I intentionally designed to be a bit vague and situated it as if they were discussing what "others" would say in hopes that participants might be more open to answering if they were given the option to not talk about themselves. I wanted participants to choose and define what they saw when they looked at the group of EML students, and I took their responses about what "others" would say as potential indicators of their own patterns of noticing. This strategy was designed to elicit racial narratives with which the participants were familiar.

Justifications

Before making any claims about what "others" might say, participants first enveloped them in justifications for why "others" would think about these children in particular ways. Across the five participants, four general justifications emerged: students' socio-economic status, the physical attributes of the students, the curriculum of the EML that the students were

receiving, and the demographics of the "others" (Table 6-3). I argue that these justifications provide a sense of how the participants saw the students (and the program itself) even though they were describing what "others" would say.

Table 6-3

Participant Justifications for Racial Narratives

Justification	Quote
Socio-economic status of the students	"a stereotype … of students of color, who are also poor, disadvantaged community"[10]
Physical attributes of the students	Others "might have low expectations of her…thinking wow here's just a minority overweight girl"[11]
Curriculum of EML program	"I think just the fact that this is basically a summer remediation program automatically people make assumptions"[12]
Demographics of the "others"	"Given how the demographics of those in education ... Typically White women, middle-class, English-speaking, if there is a religion, it's probably Christian. They probably don't know what it means to be marginalized outside of being a female. Or I should say they might not know."[13]

Socioeconomic status of the students. Although participants were not provided with any details about students, several offered justifications based on the sweeping assumption that the students had low socioeconomic status. For instance, Hally recognized that the students were Black and that this would affect how teachers viewed them. Based on their Blackness, she

[10] Hally_interview
[11] Ben_interview
[12] Elyn_interview
[13] Carmen_interview

attached additional descriptors to them when she explained, that there's "a stereotype … of students of color, who are also poor, disadvantaged community." The "also" in her statement indicates that she equates being non-White with poverty. She then uses these assumed characteristics of the students as the basis to identify the racial narratives that she later describes.

Physical attributes of the students. Another justification offered associated students' physical appearance with the type of expectations that a teacher may have of them. For instance, Ben identified three distinct physical features about Kenya that he believed would influence "others'" expectations of her. He stated that some teachers "might have low expectations of her… thinking wow here's just a minority overweight girl." Each of these features on its own evokes negative narratives. However, Ben's response points to the ways teachers biases might work in combination. He predicts that "others" would take one glance at Kenya and adopt low expectations of her.

Curriculum of EML program. Unlike the previous two justifications, this one framed as being related to the type of program that participants perceived the students were attending. This is best illustrated by Elyn's statement, "I think just the fact that this is basically a summer remediation program automatically people make assumptions." This was an interesting justification because the program is explicit about the fact that it is *not* remedial—all of the program content is grade level and above for rising fifth-grade students. Participants' comments about "remediation" seem to signal that who the students were led them to interpret the EML as "remedial." Elyn's justification raises the question of how "others" might frame the program if the students were majority White. Would they still assume it was "remedial," or would they reframe it more positively (e.g., as a summer enrichment)?

Demographics of the "others." This justification is the only one participants offered that takes the lens off the children and directs it back to the adults. Carmen said,

> Given how the demographics of those in education ... Typically White women, middle-class, English-speaking, if there is a religion, it's probably Christian. They probably don't know what it means to be marginalized outside of being a female. Or I should say they might not know.

Elyn also commented on the overwhelmingly homogenous demographics of the nation's teaching force. Carmen's and Elyn's justification here rests on the assumption that the "others" who would be interpreting children would be making these claims from the perspective of an outsider's to the children's cultures.

Summary. In summary, the ways that participants justified their comments shows that they were aware of the perceptions that are likely to be attached to Black students inside classrooms.

Racial Narratives

Shah (2017) identifies seven racial narratives in mathematics education: "Math ability, intelligence, general academic performance, personality traits, body type, family life, and career paths" (Shah, 2017, p. 21). These narratives capture the different ways that mathematics educators use race to help explain students' experiences in mathematics. Across the interviews I conducted with educators who attended the EML, there was evidence of all of these narratives except for family life. For the purposes of my analysis, I condensed Shah's seven categories into three categories, each comprising one or more of Shah's categories. They are (1) students' mathematical ability (math ability, intelligence, general academic performance), (2) performance (personality traits, body type), and (3) potential (career path). Here, I discuss the ways these

narratives showed up in participants' responses about what "other educators" might say about the EML students. While I cannot prove that these narratives reflect my participants' perceptions of the students, they do demonstrate that participants are quite aware of common deficit-based perceptions of Black students in mathematics.

Mathematical ability. Several participants' suggested that "others" might believe the narrative that Black students lack the ability to be successful in mathematics. Their comments ranged from describing Black students' capacity to handle rigor to suggesting types of instructional activities they are capable of doing. Hally suggested that other teachers would think that the EML students could not handle difficult work. She asserted that these teachers would say things like, "We need to give these kids worksheets because obviously, they can't handle the math." She also went on to say that other educators would think that "it's not only that they can't handle the mathematics, they can't handle the critical thinking skills." Elyn echoed this sentiment by predicting that other educators would think that the students in the EML are "not as quick as some of those other kids." And Merissa thought that "the number one thing that might come out is they can't do math." In each of these cases, educators' statements echo the idea that Black students do not have the talent or skills to be successful in mathematics.

Performance. The second narrative participants invoked was that Black students' behavior and presentation of self in school is below the standard expected of all students. Participants suggested that "others" would read Black students' actions and intentions in the EML as unfavorable because of this. For example, Merissa described how some educators might notice that Black students "can't control themselves; they can't just do their job." Hally also shared that "other" educators would think that these "kids aren't on their behavior." Both of these

comments imply that a student's job is to control themselves and behave in ways that signal a "right" way of being in school.

Not only did participants think that "others" would call into question Black students' actions, but they also called into question choices that students made that they claimed "others" would perceive as problematic ways of being. For example, Elyn, when describing how "others" would read a Black boy wearing a hood in class, said, "I think people would have perceived that as disrespect and as just thuggish type behavior." She went on to say that by wearing a hood, the Black boy is exhibiting "quiet defiance… he wasn't rude or anything, he was just quiet and withdrawn." Elyn's description is interesting because she recalls an action by one Black boy that took place on the first day of the EML (Figure 6-4). It is interesting to highlight here that he was the only student wearing a hoodie with the hood up that day, and neither he nor the other Black boys wore a hoodie with the hood on again after that day. It is also important to note here that the teacher never addressed the student about his hoodie, and he wore it the entire first day of class without incident.

Figure 6-5

Image of EML Class on Monday

In addition, there were two other boys (one White, one Black) wearing baseball caps during that class period and the rest of the week, but no one mentioned them or flagged them as out of place. For Elyn, the hoodie seemed to be a trigger, leading her to conclude that "others" would position the student as thuggish, defiant, and withdrawn even though, at that point in the week, educators had not had a chance to learn anything about him. Even after spending an entire week getting to know this student through the class, this one seemingly insignificant act of wearing the hood of a hoodie on Monday was still etched in her memory.

Potential. The third narrative participants invoked is that Black students do not have the same potential to obtain a job that requires at least some post-secondary education as White students. This narrative directly links opportunities that Black students receive in school to what their teachers think about their potential contributions to society (cite Shah?). Hally, while describing how “others” will view these students stated, “I think that another assumption is that these kids aren't going to be doctors, and lawyers, and professors, and any of the higher white-collar paying jobs.” Hally went on to say that the United States historically has had a significant increase in people immigrating to its shores. She claimed that this increase in immigration necessitated positioning some students as not having critical thinking skills in order to maintain a population of individuals “working in our factories, which is also a common misbelief” by many educators. Hally added that teachers “still choose not to see their potential.”

Summary. In summary, participants' responses indicate that they are aware of common racialized narratives about Black children. These stereotypical narratives shape Black students' educational experiences and have implications for their future postsecondary opportunities (Shah, year). This is because teachers who consciously or unconsciously adopt these narratives as interpretive lenses may develop practices that are informed by bias.

While participants' responses cannot be interpreted as showing what they themselves think, they signal that participants do see students' Blackness as well as see and recognize some of the social dynamics that surround Black students' identities. In addition, the ease with which participants produced these narratives shows how deeply these narratives permeate “normal” practice and “professional” perceptions and readings of Black children. After all, participants did not request time to think about their responses. Further, none of them answered the question without including negative perceptions of the children. Rather than asserting that "other educators" would notice how smart, enthusiastic, or insightful students were, their responses focused on the problems that "other educators" would identify with these students. Their responses signal how common and prevalent negative ideas about Black children are amongst educators.

Participants' responses to this question have implications for professional noticing and professional development design when the student demographic mostly consists of marginalized populations. I will discuss these implications further in Chapter 7.

Seeing Kenya?

The second interview question that I asked participants was, *“Can you describe any strengths or contributions made by students at the EML that might be different than the assumptions that you just described?”* I designed this question to explicitly direct participants’ attention towards students' strengths. Each participant took a different overall perspective when answering this question. However, four of five participants used a common student as a counterexample against stereotypical and biased assumptions that “other educators" may make about the EML students. They talked about Kenya.[14] Throughout their responses, they refer to

[14] Participants used other students as counterexamples too, but Kenya was the only one that they all shared.

her in exceptional terms, but racial narratives continue to stand out. In this section I unpack the different ways racial narratives about Black children showed up in educators' talk about Kenya.

Kenya As Counterexample

When participants described their counterexamples, a recurring theme was transformation. The participants portrayed Kenya as having a starting point that was rooted in their first impressions of her. They went on to describe that Kenya experienced transformative change across the week. Three participants in particular used a transformation framing as they upheld Kenya as an ideal counterexample to the racialized narratives described above. The participants' descriptions of transformation are below in Table 6-4. The first participant, Elyn, used the word "*blossom"* to describe Kenya's transformation. The second participant, Ben, described Kenya's transformation as "breaking the mold." While a third participant, Carmen, depicted Kenya's transformation as "a change in herself, as a student, and as a mathematician."

Table 6-4

Description of Transformations

	First Impression	Description of Transformation
Elyn	"Kenya came in the first day in boy's clothes or something that could have been more masculinized clothes. She was wearing a *Star Wars* sweatshirt, that was a guy's sweatshirt, I would guess, based on her size and just looking at the shirt itself."	"By day three or four-ish, she was in pink. Which may have absolutely nothing to do with anything, but then her hair was down, she's completely changed her hairstyle. Her tone changed with people; her attitude changed with everybody. The hard exterior went away. Honestly, by day three-ish, she just looked like a normal girl."
Ben	"Didn't she say her favorite hobby is that she likes to sleep. I mean, if you simply judged her by looking at her appearance, I guess you might have the problem of very low expectations for her. Thinking, Wow. Here's just a minority overweight girl who looks like she does not want to be here in the least."	"And then you find out later, holy cow! This girl has got some skills."
Carmen	"Kenya presented herself in the beginning as someone who's kind of here and looks like somebody who wants to kind of be hidden and introduced herself as somebody who likes to sleep. And I think if a person were to just look at Kenya, it's (a) she's a girl, (b) she's got a very dark complexion, and (c) she's overweight. Somebody might look at her and say, 'Yeah, I can see that,' you know?"	"But if they continue to watch her and listen, her responses went so much deeper, certainly than what I would think someone would expect to come from Kenya, but also so much deeper than I think what we heard from any of the other students during that first week. So, she was an individual who would kind of check that."

"She Opened Up and Blossomed"

Elyn's report of her first impressions of Kenya are rooted in racialized assumptions about acceptable gender presentation. First, Elyn perpetuated gender norms by describing Kenya's outfit as "masculine," suggesting that only boys wear clothing with the *Star Wars* logo on it and implying that Kenya must be wearing "a guy's sweatshirt" because of her size. She followed this up later in her interview by saying that Kenya's outfit suggested that there was a "gender thing" going on with her. By the end of the week, according to Elyn, Kenya had transformed: "She opened up and blossomed." Elyn cited a change in the color of her clothing, hairstyle, and attitude as evidence that a transformation occurred. She also noted a change in Kenya's tone and her "hard" exterior.

Earlier in the interview, Elyn stated that one reason why "other" teachers may have stereotypical perceptions of Kenya was her hairstyle.

> I think that the fact that her hair was in cornrows, or she had the braids all the way. Not cornrows, but braids. It was a very stereotype type look on her. Then that they were loose and frizzy and her hair needed to be redone type thing, would have had people to assume that they knew something about where she came from and who she was.

Elyn also cited the change in Kenya's hairstyle from beginning to end of the week as further evidence that she had "blossomed."

Figure 6-5 shows Kenya as she entered the classroom each morning of the first week of the EML. As the picture shows, Kenya entered the classroom each day wearing her *Star Wars* jacket, although on Wednesday she had tied the jacket around her waist. When she had the jacket around her waist, we see that she was wearing a pink t-shirt underneath; on the other days, she had the jacket zipped up, concealing whatever she had on underneath. In addition, she started off

the week with her hair braided; on the other days, she alternates between afro puffs with green barrettes and an afro.

Figure 6-6

Kenya's Outfits Each Day Across the Week of the EML

Note. The image progression moves from Monday (far left) to Friday (far right).

According to the Collins dictionary, when the verb “blossom” is used to describe a person, it means they “develop good, attractive, or successful qualities.” According to the Cambridge dictionary, to describe a person as blossoming means that “they become more attractive, successful, or confident.” So, what does this mean? Elyn used this language to describe what she perceived as positive a change in Kenya, shedding her "hard exterior" and becoming more like a “normal girl.” Her comments offer insight into what Elyn considered a “normal girl” to be, a definition that is deeply raced and gendered. For instance, Elyn's comments about Kenya's hair reflect dominant white beliefs about the unacceptability of Black people's hair. She commented that (1) Kenya’s hair was in a stereotypical style, braids; (2) it was not "neat"; and (3) the style and quality could be taken as indicators of what type of neighborhood she lived in and what kind of person she was.

Regarding Kenya's clothing, the students had been told that they could wear a sweater or jacket because the classroom was usually quite cold. This could have been the reason why she chose to wear a jacket. Additionally, at the time of this EML, *Star Wars* was experiencing a resurgence in popularity due in part to sequels that featured a woman in the lead role. It's entirely possible that Kenya could have been a fan. However, instead of proposing these as reasons for Kenya's choice of attire, Elyn made a considerable leap from a young girl wearing a jacket with a popular movie logo on it to questioning that girl's gender presentation. Moreover, Elyn also claims that Kenya's size was a contributing factor to her choice in outfit, implying that she can only fit into "masculine" clothing.

It is clear that Elyn's first impressions of Kenya situated Kenya outside her definition of being a "normal girl," positioning her as lesser than other students. Although, Elyn shared these ideas under the umbrella that these were what "other" people would think, it is evident that she, too, held these opinions about Kenya. In particular, she incorporated an assessment of Kenya's hair her counterexample illustrating Kenya's supposed "transformation" across the week. Elyn seemed to find the change in styling from Monday to Friday more appealing, which, in her estimation, helped nudge Kenya over closer to performing as a "normal" girl.

Finally, I also examined Elyn's logs for any observations she made about Kenya during the week. I looked for evidence that she was tracking on Kenya's "transformation" or had noted any evidence to further her claim that Kenya "blossomed" across the week. However, Elyn's logs reveal that she only made two observations specifically about Kenya during the entire week.

Her first comment about Kenya was about her mathematical work with the *Writing Equations for 10 task.* The task asked students to write as many equations for 10 as they could. Elyn wrote in her log that Kenya answered $10 \times 10 = 100 \div 10$. She followed that observation

with the comment that Kenya “shows a true understanding that both sides of the equal sign need to be balanced.” The second instance in which Elyn wrote about Kenya was in reference to Elyn's perception that the teacher was letting the class run free and not insisting that Kenya and Star participate in a group activity. She wrote:

> The intention to produce agency in students seems to be resulting in students struggling to recognize boundaries. Without boundaries, life becomes a free for all. Star and Kenya are not being required to participate. The math is being accomplished but the sense of community is being further broken because students refuse to work together.

In all, Elyn's observations in the digital logs seem to be disconnected from the way that she described Kenya’s "transformation" in the interview. According to her logs, Elyn noticed very little about Kenya during class, yet in the interview she built a case for Kenya as a counternarrative based on her vivid impressions and strong opinions about the girl's appearance and self-presentation. All in all, neither Elyn’s counternarrative nor her log entries reflected any substantive attention to Kenya’s mathematical abilities or brilliance.

“She Broke the Mold”

Similar to Elyn, Ben's interview also reflects assumptions about Kenya rooted early in the week. When offering her as his counterexample, the first thing he named was that she said that she liked to sleep during her introduction on the first day. He connected this to her appearance, stating, "Here's just a minority overweight girl who looks like she does not want to be here in the least." Based on these details, he concluded that teachers may have low expectations of her in the beginning. He then used the phrase “holy cow” to exude surprise and excitement at the revelation that Kenya was actually talented.

Like Elyn, Ben implicitly ignores a range of explanations for Kenya's presentation at the beginning of the week that would have contextualized her as a typical pre-teen. For example, he seems to assume that Kenya saying that she likes to sleep signals that she is lazy and unmotivated; he explicitly ties this assumption to her racialized and gendered identities, as well as to her size. He does not name any of the other many possible reasons why a child may say she likes to sleep. For instance, he does not mention that she was a pre-teen whose body was growing and likely needed a lot of rest. Nor did he consider aloud that her parents might have kept her busy with activities during the summer so that having some down time to catch up on sleep was something she looked forward to doing. Nor did he name any other potential reasons that could account for her comment. Instead, he concluded that "other educators" would assume she was lazy and unmotivated, reflecting the racial narrative that Black children do not meet standards of performance in school (Shah, year).

Ben went on to say that, in defying his initial expectations of her, “She was certainly one who broke the mold, I guess you might say, once you got to know her a little.” According to Grammarist.com, the phrase “break the mold” is an idiom describing someone’s uniqueness.” Ben's use of this phrase in context suggests that he did not assume Kenya’s uniqueness as a starting point but was only able to see it after getting to know her throughout the week. In this way, Kenya, a child, is held responsible for *proving* that she is special and worthy, rather than adult educators being responsible for *assuming* her brilliance from the beginning.

According to Ben’s daily logs, he made the following observations about Kenya throughout the week:

- Day 2: “Seems disengaged.”
- Day 4: “Very engaged and ready to contribute.”

- Day 4: “Smiling.”
- Day 4: “Works well with J and Karma.”
- Day 5: “Didn’t participate, didn’t like her group.”

Each of these comments are about her superficial performance of "engagement," and none of them are about the mathematical work that Kenya contributed or produced during the week. Although, there were a lot of children to focus on, in addition to the teaching and content, Ben chose to single Kenya out as his counternarrative because he was so impressed with her skills. It's incongruous, then, that he failed to capture any of evidence of his attention to her skills in his logs across the week.

Again, like Elyn, Ben's idea that Kenya "transformed" from Monday to Friday was rooted in his first impressions of her based on racialized and gendered readings of her self-presentation. What's interesting about Ben's counternarrative is that the physical descriptions that he identified about Kenya at the beginning of the week were still true at the end of the week. His new view of her by Friday was focused on Kenya’s being “skillful,” even though he did not log any noticings about her skills.

“A Change in Themselves, as a Student, as a Mathematician”

During her interview, Carmen shared that she noticed that many of the students started to see themselves as mathematicians across the week:

> While they may not have worded it like that, you could see a change in themselves, a change in their posture, a change in the types of responses that they were giving. They struck me as a student, as a mathematician, who had a little bit more confidence than what they had in the beginning. Kenya was a perfect example in my mind of what that looked like.

According to Carmen, the changes she noticed in Kenya had to do with a shift in her confidence that permeated throughout the way she moved through the classroom and how she responded to and engaged with the mathematics. Like Elyn and Ben, Carmen's assessment of Kenya reflected a number of assumptions with very little evidence. For example, Carmen said, "Kenya presented herself in the beginning as someone who's kind of here and looks like somebody who wants to kind of be hidden." She did not offer any explanation for what it was about Kenya that signaled she wanted "to kind of be hidden." Carmen also cited Kenya's racial and gender presentations as reasons "other educators" might underestimate her:

> And I think if a person were to just look at Kenya, it's (a) she's a girl, (b) she's got a very dark complexion, and (c) she's overweight. Somebody might look at her and say, "Yeah, I can see that," you know?

Further, Carmen framed Kenya's "transformation" as Kenya performing more “like a student” by the end of the week. She notes that Kenya's responses to the mathematics "went so much deeper, certainly than what I would think someone would expect" and "so much deeper than I think what we heard from any of the other students during that first week." She contrasts this with her initial impression of Kenya, implying that the way she showed up in the classroom did not match Carmen's expectations of what a "real" student or mathematician should look and sound like.

According to Carmen’s logs she made the following observations about Kenya during the week:

- Day 3: “Her number sense is developing.”
- Day 4: “Works well with partner and encourages her partner.”
- Day 5: “Hasn’t heard much from her today.”

Like Elyn and Ben, Carmen captures relatively little about Kenya in her daily logs. Unlike the others, she does manage to make one comment about Kenya's mathematical thinking (Day 3). However, there's nothing in the logs to reflect the "deeper" contributions Kenya supposedly made across the week. Although Carmen was eager to share about Kenya as a counternarrative in her interview, her logs capture very little about Kenya in Carmen's day-to-day noticing.

Just like Elyn and Ben's analyses, Carmen's take on Kenya's "transformation" imply that she had to *prove* her worth by overcoming initial impressions, rather than educators simply assuming Kenya's innate brilliance as a starting point. Carmen's claim that Kenya "transformed" into a deep thinker, a real student, a mathematician despite her gender, her skin complexion, and the fact that she was overweight signals that Carmen assumes that children like Kenya cannot be assumed to be deep thinkers and mathematicians. Carmen explicitly referenced Kenya's racialized and gendered self-presentation as an explanation for why "other educators" might have low expectations of her. This is another example of a participant leading with physical descriptions and providing little evidence of mathematical thinking to claim a profound "transformation."

Summary

The racial narratives attached to Kenya's black girlhood made her both invisible and hypervisible to the educators. She was invisible in the sense that educators did not see her brilliance as a given. She was hypervisible in the ways that they attended to her physical appearance and used it as evidence of "other educators'" negative interpretations of her. Taken together, participants' analyses of Kenya as a counternarrative reflect racial narratives that associate racialized and gendered ideas about physical appearance and academic achievement. All three participants who highlighted Kenya as an example of "transformation" did so by

focusing on the ways that "typical" educators would read her physical appearance as a sign that she lacked mathematical ability, would perform poorly as a student, and had limited potential. In their attempts to reframe Kenya as having "transformed," participants themselves reinforced these same racial narratives.

Each day Kenya was brought up in the prebrief and debrief discussions, however, neither the teacher nor the facilitator mentioned her dark skin tone, her hair, her body size, her gender identity, or her socioeconomic status. Not only were these things not brought up by the teacher or facilitator, but they were also not discussed publicly by the observing educators. Participants' held these assumptions and judgments about Kenya constant (to themselves) throughout their participation in the supporting structures offered to help them see and analyze practice. While participants were learning about the experiences of Black children, working on mathematics, and investigating the teacher and teaching practices, they maintained these unfair and oppressive views of Kenya. And not just Kenya, but other children as well. It is clear from participants' interview responses and daily logs that they did not see Black children as brilliant on day one. Instead, Kenya and the other children had to perform in certain ways before educators would entertain the idea of their brilliance.

Participants described Kenya as experiencing a transformation from Monday to Friday as a result of the work of the teacher. I do not challenge the notion that the work of the teacher had an impact on students throughout their time in the EML. But what I notice in participants' counternarratives about transformation is the impact that the teacher and facilitator had on participants through their work during the prebrief and debrief sessions. I argue that the “transformation” that participants described seeing in Kenya and her classmates was really a transformation in the way that they were able to see children over the course of the week.

Participants took up opportunities to learn that, in their framings, aided them in seeing transformations in children.

For example, during the prebrief session on Tuesday, the teacher showcased Kenya's answer "as many as the universe" from the previous day as interesting for the group to consider together. She made sure that Kenya's attempt to describe something without end (i.e., "the universe") did not go overlooked by the observing educators. The teacher repeated this move on Wednesday by showcasing Kenya's notebook, again on Thursday by highlighting her homework and her deep thinking, and once more on Friday with a statement about how complex Kenya really was. Each day, the teacher publicly and explicitly highlighted Kenya's strengths and the things about her that made her special—attributes that were visible to the teacher from the beginning of the week. This in turn had an impact on how educators took up Kenya. In other words, the teacher could see Kenya's brilliance and used her status to make intentional moves throughout the week to help the observing educators learn to see it as well.

Both the teacher and the facilitator did this type of work with many children throughout the week. They were especially careful to highlight children who educators were beginning to apply negative tropes to in their talk. For example, when educators began to make comments about Nadira, a Black girl, and her ability to finish work on time and inability to understand the mathematics, the teacher reframed that narrative by sharing with them that Nadira had high standards for herself around completion. The teacher shared that when Nadira is at home and has the time and space she needs to complete here work you can see it, and in class she just does not have the time she needs. Instead of taking up the educators' tropes, the teacher and facilitator worked to reframe for educators what was happening. Further, when educators expressed unfounded judgments about students (e.g., assuming difficulty reading), the teacher and

facilitator pushed back and reminded educators that they didn't know the children and that the teacher herself was still getting to know them. Throughout the week, the teacher and the facilitator used layering moves to take on an investigative stance towards students and the live instruction, and they modeled that stance for educators.

I argue that participants were mislocating the transformations they believed they observed. This is why participants who talked about Kenya's "transformation" were unable to provide any real evidence that supported the idea that she had transformed. The reason they weren't able to offer substantial evidence is that Kenya didn't make a huge transformation. She was who she was from Monday to Friday. What I suggest was happening instead is that participants learned to see her differently across the week. The teacher's public acknowledgments of Kenya's brilliance shifted participants' perspectives enough that they were able to start seeing Kenya the way that the teacher saw her. To participants this process felt like Kenya was having a transformation, but the teacher was highlighting and showcasing her innate brilliance to make it visible to them.

This process was clearly not a perfect intervention because participants continued to hold onto pervasive and deep-rooted racial ideologies as reflected in their interview responses. But we also see that Kenya's brilliance was starting to become more visible to them by the end of the week. I put forth the idea that the PBPD facilitator and teacher's efforts to intentionally create opportunities to showcase Black students' brilliance enabled educators to begin to see the wonderful and special things about Kenya and her classmates.

In Chapter 7, I discuss implications of these findings for the design and implementation of practice-based professional developments.

Chapter 7
Conclusion

In this chapter, I present a summary of the study, revisiting the two research questions that influenced the study. What follows is a discussion of conclusions drawn and limitations of the study. I conclude the chapter by outlining my recommendations and implications for continued teacher education.

The Study

I began thinking about this research project during the summer of 2013 when I first attended the EML. That year there were 30 students, mostly students of color, and about 80 educators, mostly White and Me. Moreover, all I could see during my first visit was a large gap between the 'two realities. My lens was grounded in my experiences of teaching Black children, seeing them in their fullness, and rooted in my experiences as a Black girl who knew what it felt and sounded like to not be fully seen or taken seriously in school. White educators' lenses were filtered through racialized narratives and misinformed ideologies about the teaching and learning of mathematics for/by Black students. Subsequently, I began to ask: What moral responsibility do PD designers hold to children, families, and communities when they create learning spaces for educators built around Black children? In what ways are PDs like the EML reinforcing negative beliefs about Black children and in what ways are they disrupting those beliefs? What are educators noticing during the EML? In what ways are the prebrief and debrief sessions considering harmful views of Black children and working towards intervening? What are educators taking away from their experience at the EML? Where are the best practices for

designing and facilitating PD's that do not have the luxury of time and space to help shape professional vision? These questions inspired this study.

The purpose of this study was to investigate structures embedded inside a practice-based professional development that supported educators in observing instruction that operated from the premise that Black students are brilliant. Specifically, using qualitative case study methodology (Yin, 2018), situated within a racialized sociohistorical context (Ladson-Billings & Tate, 1995), I identified opportunities to learn and how those opportunities were taken up by five educators. Two research questions that guided this study were:

1. What opportunities to learn were offered in the practice-based professional development structures surrounding "live instruction" to support participants to see the brilliance of Black children's mathematical thinking in practice?
2. What patterns exist in the way participants took up opportunities to notice and interpret Black children and the work of teaching in real time?

This study was not about capturing what educators learned during the EML, but on how they took up opportunities to learn within the supporting structures. The study aimed to uncover the opportunities to learn embedded with the discussions between facilitators and educators that influenced how educators observed the live instruction situated within a sociohistorical context. The conceptual framework included critical race theory, professional noticing, and opportunities to learn.

Within a critical race theory frame, I began the study with an acknowledgment of how white supremacy marginalizes Black children by way of their experiences in school. I also acknowledged that properties of professional development programs are likely to reflect the permanence of racism, Whiteness as property, and interest convergence. These

acknowledgments, I believe, guided facilitation and discourse during the prebrief and debrief sessions, and facilitated educators' overcompensation and resistance to how they see children.

Within a professional noticing frame, the research study began with an acknowledgment that noticing Black students' brilliance as a resource during instruction is not intuitive. This acknowledgment, I believe, accounts for the acts of negotiation that educators had between deeply rooted stereotypical ideas of Black children and making sense of seeing their brilliance used as a resource during instruction.

Within an opportunity to learn frame, I began the study with an understanding that a potential opportunity to learn was the availability of something to learn and was only considered an opportunity if educators made use of it. This understanding, I believe, created a gateway to see what components of the supporting PD structures impacted the ways in which educators noticed and interpreted Black students' brilliance as a resource during live instruction.

Summary

Video recordings of the prebrief and debrief sessions were watched and coded in one-minute intervals for the opportunity to learn. In addition, five participants, all attendees of the EML professional development program, completed a survey, kept daily logs, and participated in a semi-structured interview. The next section is a conclusion to that analysis.

As the findings from this dissertation show, the EML's supporting structures had opportunities for educators to learn about the experiences of Black students, to think about the mathematics needed for teaching, and to analyze the teacher and her practices of incorporating Black students' brilliance as a resource in the classroom. Participants reported that these opportunities prepared them for live instruction, and supported their observations during live instruction.

Across the week, inside of the prebrief and debrief sessions, educators spent 36% of their time engaged in discussions about the students in the class. Facilitators took up race by using Black students' typical experiences in school at large to create opportunities to engage educators in the analysis of students' interactions with the content and teaching practices inside of instruction. There was some evidence that the use of typical interactions between Black students, teachers, and content was considered by study participants but not any evidence that those opportunities were completely taken up by participants. There was also evidence that even in participants' attempts to consider and observe instruction with a more informed lens, racial narratives and elitist ideas about mathematics still held steady in what they noticed.

Domain specific opportunities to learn made available resources that educators could pull from in order to notice Black students' brilliance as a resource during instruction. Across the week, inside of prebrief and debrief sessions, educators spent 40% of their time engaged in a discussion about the mathematics. Facilitators layered opportunities to work on mathematics with opportunities to understand the pedagogical content considerations better. The way that educators worked on mathematics was synchronous with teaching consideration sand how students typically engaged with the content. Study participants reported that working on mathematics mattered and supported them in observing live instruction in new ways. More specifically, having the ability to see students' thinking reduced how much they looked for other things.

Opportunities to learn that transparently made the teachers' intent and decisions during discretionary moments were used as a resource for teachers to decipher how the teacher used Black students' brilliance as a resource. Across the week, inside of prebrief and debrief sessions, educators spent 55% of their time engaged in discussions about the teacher and analyzing her

teaching. Facilitators used resources and activities that increased the level of transparency into the teacher's decisions, moves, and plans. Transparent acts by facilitators created opportunities to support educators to listen and interpret student thinking, analytically consider positive and negative outcomes of in-the-moment decisions, and formatively assess individual students and the whole class across the week. Study participants reported that without resources and activities that promoted transparency, it would have been hard for them to interpret, justify, and assign value to what they were watching during the live instructions.

Resistance

Prior to this study, it was difficult to make predictions on how educators were taking up opportunities to learn in the prebrief and debrief sessions. The findings show that OTL created a pathway for educators to start to notice new things in new ways. However, findings also show that just because opportunities are provided does not mean that they are fully taken up in ways that ultimately intervene on racist and elitist strongholds embedded in how White teachers see Black children. One take away from this study is that educators did not fully take up OTL to notice and apply them to their observations. Instead, showed forms of resistances in their interpretations and analysis of instruction.

Subtle tension inside of the discussions began to develop across the week. The tension were a result of educators having deficit views of Black children and being immersed in a space that encouraged them to think of those same children as brilliant. The tension that played out across the week was in the discussions which displayed educators' resistance to some of the EML's premises. In this case, I use the word resistance not to indicate that educators flat out denied the claims that Black students were brilliant but instead found themselves in a compromising position wherein the one hand they are showing signs that their OTL was

improving their ability to notice new things during instruction. During participants' reporting of new insights, their contributions were laced with deeply embedded ideas that clung to racist ways of viewing Black children or exclusionary ideas and practices associated with teaching and learning mathematics.

In some instances, resistance played out in how educators talked about developed interpretations of the students across the week. One example of resistance was seen in the discussion concerning Kenya and labeling her as a counternarrative. In the discussions about Kenya, educators acknowledged their awareness of negative racialized narratives about her. In turn, they created storylines of transformation as they began to notice new things about her across the week. The transformations were built on the foundation of racist ideas and morphed into the realization of her smartness. Educators presumably walked away thinking that using strategic mathematical task, and equitable teaching strategies over time allowed Kenya to show that she was smart. Instead of challenging themselves to reflect on why Kenya was not allowed the privilege to be smart on the first day regardless of what she was wearing, her complexion, or hairstyle. Educators' uncomplicated and uncritical views of Kenya may cause them to ignore further the fullness of their Black students' childhood in their classes, which is also being ignored by Whiteness. If educators walked away, thinking that students transform by their actions into being seen as smart, then they are still flattening out the fullness of their humanity and not attending to students' inherent brilliance.

Implications

This study has raised important questions about the nature of facilitating professional development programs that 1) incorporate live instruction, 2) foregrounds race and equitable concerns by centering Black students inside of instruction, and 3) approaches content through

mathematical knowledge for teaching. The EML's approach is first to highlight how race operates in school by exposing typical ways that Black students experience both schooling and learning. The facilitators then build bridges through OTL for reluctant and resistant participants to see and experience first-hand the incorporation of Black students' brilliance as a resource inside of instruction. Inside of the EML's approach are layers of complexity both around racism and mathematical knowledge. These layers of complexity are best illustrated as a minefield ready to explode at any time due to the wide range of experiences educators bring to the PD. With the consistent hotspots of complexity, I wonder how the facilitators need to be aware of themselves and be accountable to what they are working on to disrupt White social norms for talking about race and inequity in schools are?

In all professional developments, the facilitators carry the burden to manage participant contributions. According to Paul Gorski (2019), one detour that appears in professional development programs that attend to equity is pacing-for-privilege. He describes this detour as an approach that "coddles the hesitancies of people with the least racial equity investment while punishing people with the most investment" (Gorski, 2019, p. 57). This detour was visible in the EML during instances when facilitators accommodated educators' feelings and fears by not directly confronting them with the consequences of their contributions. These were either overcompensating for their power and privilege or presented as resistant to ideas that conflicted with their power and privilege. Across the week, when statements were made that were in conflict with the EML's logical preemies, facilitators would either wait and address their concerns in a sweeping conclusion that did not point out anyone specifically but that also generally applied to everyone. These sweeping comments cautioned educators about particular trains of thought and presented consequences. However, the work of connecting the cautioned

statements by the facilitators to a specific contribution was left up to the educators to do themselves. In the time span of moments, they had to figure out what precisely the facilitators were referring to. I can imagine that because the cautioned conclusions were at the end of segments, the potency of its messages was often watered down by a general position to do better and be better. Considering the facilitators' actions and how those actions created additional work for the educators, I wonder what the work of the facilitators to help participants complicate and nuance their thinking while also holding them accountable when they say problematic things is.

We know that as a result of the racial climate of our country, teachers will enter into PBPD settings with negative racial narratives of Black children. Whether or not they communicate them in the same ways that I saw in this study, PBPD facilitators need to be proactive about designing for how they will layer in opportunities to learn that push back on those narratives. In addition to being strategic about layering OTL, it is also my recommendation that facilitators engage in training that specifically supports their work to recognize and interrupt negative racial narratives. Such training could consist of the following:

1. Exercises and activities that require facilitators to interrogate their own identities and biases. They should be supported to discover what might surface for them as barriers against pushing back on ideas that do not represent the goals of the PBPD program.
2. Practice having what Glenn Singleton (2015) calls “courageous conversations.” This practice should include opportunities to reflect on when and how to have these conversations in ways that push the work forward and engage participants who arrive to PBPD programs with varying levels of experience and comfort participating in such conversations.

3. Develop a set of "non-negotiables" of ideas or comments that will not be tolerated in PBPD. This work would include developing facilitators' ability to recognize and communicate the consequences for children when these "non-negotiable" ideas are allowed to linger in a public space without being addressed.

Finally, some may suggest that one way to support PBPD participants in seeing the brilliance of Black children would be to extend participants' time at the EML. However, I argue that it is not the quantity of time that participants spend at the EML that makes the most difference, but instead *the quality of their experiences there*. An important way to improve the quality of the experience for participants is by supporting facilitators to apply what has been learned in this study to become ever more cognizant of and explicit about the racial narratives that swim in this space. Addressing the racial narratives about Black children that educators bring with them, would allow them to start to release those ideas as absolute truth and would create space for them to learn to see Black children in new ways.

Appendices

APPENDIX A

Time Analysis Data

Coverage of Capability and Identity

		Agency & Power	Rights as Learners	Identity	Capability	Voice	Presenting at the Board
Monday	Prebrief	2	1	0	0	0	0
	Debrief	2	4	3	1	1	3
Tuesday	Prebrief	1	0	0	3	0	1
	Debrief	7	2	3	1	3	1
Wednesday	Prebrief	0	7	2	2	0	0
	Debrief	1	0	0	4	3	0
Thursday	Prebrief	3	2	0	0	0	0
	Debrief	0	0	0	1	1	0
Friday	Prebrief	3	0	3	0	0	0
	Debrief	3	2	6	5	0	0

Coverage of Typical Experiences in Schools

		Discipline Practices	Seen by Teachers	Inequities being Reproduced	Experiences in School
Monday	Prebrief	0	3	1	0
	Debrief	3	4	1	0
Tuesday	Prebrief	0	0	0	2
	Debrief	2	4	0	0
Wednesday	Prebrief	0	1	0	2
	Debrief	1	4	0	1
Thursday	Prebrief	0	1	0	0
	Debrief	0	0	0	0
Friday	Prebrief	1	0	0	0
	Debrief	0	0	0	0

Coverage of Students' Interactions

		Engagement	Behavior	With Teacher	With Other Students
Monday	Prebrief	0	3	1	0
	Debrief	3	4	1	0
Tuesday	Prebrief	0	0	0	2
	Debrief	2	4	0	0
Wednesday	Prebrief	0	1	0	2
	Debrief	1	4	0	1
Thursday	Prebrief	0	1	0	0
	Debrief	0	0	0	0
Friday	Prebrief	1	0	0	0
	Debrief	0	0	0	0

Coverage of Mathematical Content and Students

		Specific Student Thinking	Typical Trends in Student Thinking	Mathematical Practices
Monday	Prebrief	0	0	3
	Debrief	7	0	0
Tuesday	Prebrief	8	9	1
	Debrief	3	0	0
Wednesday	Prebrief	6	2	1
	Debrief	7	2	20
Thursday	Prebrief	7	4	0
	Debrief	37	0	0
Friday	Prebrief	12	0	0
	Debrief	4	0	4

Coverage of Mathematical Content and Teaching

		Use of Materials and Manipulatives	Instructional Support
Monday	Prebrief	0	0
	Debrief	0	2
Tuesday	Prebrief	8	0
	Debrief	0	0
Wednesday	Prebrief	0	1
	Debrief	0	10
Thursday	Prebrief	0	0
	Debrief	0	0
Friday	Prebrief	1	0
	Debrief	0	0

Coverage of Mathematical Content and Curriculum

		Decomposing Task and Math Space	Core Math Ideas	Common Core State Standards	Scope of Content
Monday	Prebrief	0	0	1	4
	Debrief	0	0	0	0
Tuesday	Prebrief	6	0	0	2
	Debrief	4	0	0	0
Wednesday	Prebrief	3	6	0	0
	Debrief	12	0	0	0
Thursday	Prebrief	19	0	0	0
	Debrief	8	0	0	0
Friday	Prebrief	2	0	0	2
	Debrief	2	0	0	1

Coverage of the Teacher's Disposition

		Professional Experience	Cultural, Social & Political Development	Commitment to Children and Their Families	Disrupting Inequitable Practices	Learning is Constructive
Monday	Prebrief	3	3	3	1	0
	Debrief	0	0	6	10	2
Tuesday	Prebrief	0	0	1	1	1
	Debrief	2	0	2	2	0
Wednesday	Prebrief	1	3	0	2	0
	Debrief	2	0	2	2	0
Thursday	Prebrief	2	1	3	1	0
	Debrief	0	0	0	3	0
Friday	Prebrief	0	1	0	5	1
	Debrief	12	1	0	1	0

Coverage of Planning and Design Considerations

		Lesson plan Design & Learning Goals	Classroom Environment & Physical Space	Instructional Decisions While Teaching
Monday	Prebrief	14	3	0
	Debrief	3	2	9
Tuesday	Prebrief	11	1	11
	Debrief	6	2	6
Wednesday	Prebrief	15	0	2
	Debrief	3	0	10
Thursday	Prebrief	12	0	1
	Debrief	11	1	3
Friday	Prebrief	19	7	3
	Debrief	5	2	0

Coverage of Practices that Disrupt Patterns of Inequity

		Building Trust	High Expectations	Norms Routines for Discourse	Physical Presence	Maintaining a Focus on Content	Assigning Competence	Interrupting Punishment Practices	Discussion Leading Practices
Monday	Prebrief	2	0	0	0	0	1	0	0
	Debrief	10	2	7	1	1	2	6	3
Tuesday	Prebrief	0	1	1	0	0	0	0	0
	Debrief	6	1	0	1	3	4	2	0
Wednesday	Prebrief	0	0	0	0	0	0	0	0
	Debrief	2	1	0	0	2	1	7	1
Thursday	Prebrief	0	0	0	0	0	0	0	0
	Debrief	0	0	0	0	0	0	0	0
Friday	Prebrief	0	0	0	0	0	0	0	0
	Debrief	0	0	0	0	0	0	0	1

APPENDIX B

2017 University of Michigan Summer Mathematics Program Overview

Program overview

Math Class: The morning mathematics class is taught by Dr. Deborah Loewenberg Ball. Dr. Ball is an experienced elementary teacher and a faculty member at the School of Education at the University of Michigan. During this two-week class, students will work on several topics that are important for success in fifth grade such as fractions, number lines, equivalence, and place value. They will also work on important mathematical skills like explaining, representing, proving, and defining. Such mathematical concepts and skills are foundational for math in middle and high school. In addition, students will develop study skills for learning mathematics that will help them in fifth grade and middle school.

Arts Programming: In the afternoons, students will participate in an arts program at the University of Michigan Museum of Art. Students will use the Museum collections to learn about a mix of artistic styles and to inspire their own creations.

Tutoring Program: The fifth graders will work with a U-M college student on personalized math games and activities to build skills in a fun and engaging way.

Homework

Students must complete approximately 30 - 45 minutes of homework each weekday. Homework assignments will provide students with opportunities to practice and extend what is being worked on in class. These assignments will be distributed at the end of class and are due the next day.

Student expectations

Students are expected to: attend class every day; keep neat, detailed records of my mathematical thinking; complete their homework carefully each night; and be ready to engage in the day's mathematics work. During the arts program, students are expected to pay attention and participate in the activities.

Closing celebration

On Friday, August 7, students and their families are invited to a closing celebration at the School of Social Work Building. During this celebration, students will have the opportunity to share what they have learned with each other and their families.

Observers, Documentation, and Research

The Elementary Mathematics Summer Program is designed to provide opportunities for education students, professional educators, and researchers to study the teaching and learning of mathematics. There will be observers in the mathematics class every day, and the class will be documented with video, audio, and written notes. Students' written work will also be copied. Students may be asked to be interviewed by program staff about their learning. Being observed and recorded each day is part of the program and *is not optional*. These materials will be used by the University of Michigan School of Education and others to:

Study the learning and teaching of mathematics

Create commercially available educational materials for training teachers and other education professionals, as well as free educational materials

Create promotional and general communication materials about the summer program and other TeachingWorks and School of Education programs

Build a password protected online library of professional teaching resources

Finally, members of the press or other news and communications groups visit the class and take photos for their publications or to ask students about their experiences in the class. Students are always introduced to these visitors and *given a choice* about whether or not to participate in any interviews or other conversations outside their normal studies and are never left alone with any adults who are not part of the regular staff. More information about these interviews can be found in the "Permission to photographed, recorded, and interviewed by the press" form included in your packet.

Contact information

Please call or send email if you have questions or need additional information.

Morning class teacher: Dr. Deborah Ball, cell phone: email:

Summer Program Principal: Dr. Henry Meares, cell phone: email:

APPENDIX C

Interview Protocol

1) There was so much to notice during the first week. I am really interested in learning more about how you identified what was noteworthy and significant among the things that happened. How did you decide what was significant enough to indicate on your observational protocol?
    a. Can you think of other things or categories of things that you thought were important but didn't put on the tool? What were they?
    b. Did you find it helpful to use the observational tool? If so was the tool useful to help you track on the significant moments in EML? How was the tool useful for this work?
2) I'm interested in how your ideas changed across the week. Did your ideas about what was considered significant to notice and record on the observational tool change across the week?
    a. If yes: why do you think there was shift? Or
    b. What contributed to your change in identifying elements as significant?
3) Have your ideas about students or what they are able to do changed in any way after attending the EML?
    a. If yes: Could you give me a couple of examples?
4) One goal of the EML program is to specifically work with diverse students. The students recruited for this program come from a working-class community where many of the students are members of historically marginalized groups, specifically African American students and students who are economically disadvantaged (i.e. those who live in poverty). I am interested in learning more about how students from these communities are perceived by observers and educators.
    a. If **other** educators visited a classroom with similar demographics to the one of the EML, what do you think these educators might "typically" see or say about these children?

b. What do you think might be "typical" narratives or assumptions **other** educators may say about students who are similar to the ones that attend the EML? Can you describe different comments or observations you think they might say? Why do you think people may say these things?
c. Based on your observations at the EML, can you describe strengths or contributions made by the EML students that might be different than the assumptions you described earlier? It would be helpful if you could provide the student's name and specify the strength or contribution you observed. (Interviewer note—unpack the comments to get specific information if possible.)

5) Now I would like to shift the focus slightly to focus on your observations of the students and the mathematics content. When thinking about what typically happens in mathematics classrooms, what comments do you think educators would make about students similar to those in EML when doing math?
    a. What do you think makes people think these things or make these comments? Are there things you observed in EML that you think might help educators to see these students differently?
6) You had many opportunities during the first week of the EML to do the math or types of math that students also work on during the lab class (e.g. prebrief and in PD). Did that impact the ways in which you noticed or what you were able to notice about students interacting with the mathematics.
    a. If so how?
7) The EML is considered a practice-based professional development. This is because it is situated within our professional context. There were many supports weaved throughout the structure of the EML & PD that were designed to bring you more inside of practice (The work of teaching, and learning mathematics).
    a. Are there any that stood out to you that you would say were really helpful in helping you see and interpret some of the complexities of teaching and learning mathematics?

APPENDIX D

Code Book

Theme	Categories	Aspects
Initial codes	**2nd level Codes**	**Descriptive codes**
Professional development	Intro and setting	1. Context
		2. Purpose of PD
		3. Norms and routines for working together at the EML
	Goals for PD participants	1. Trying something
		2. Think about or consider something
		3. Look for or track something
		4. Facilitator prompt or focus of the day
		5. Practice the work of teaching
Pedagogical content knowledge	Content and students	4. Student thinking (individual and class)
		5. Typical trends of student thinking and experiences with content
		6. Mathematical practices
	Content and teaching	3. Use of materials and manipulatives
		4. Instructional support given specific to the content
	Content and curriculum	5. Decomposing the task or mathematical space for teaching
		6. Helping educators understand or think deeply about core mathematical ideas
		7. Common core state standards
		8. Scope of content/curriculum of the EML
Black students	Capability and identity	1. Agency and power
		2. Human rights/Humanizing experiences/Students desire
		3. Identity (e.g. math, writer, thinker) and attributes (e.g. perseverance)
		4. Seeing capability
		5. Valuing student voice (e.g. notes to self)
		6. Presenting at the board
		1. Discipline practices, controlling students and their bodies

	Typical experiences in school	2. How are they seen or identity is taken up by others (expectations, status)
		3. Inequities being reproduced
		4. Experiences in school
	Student interactions	1. Engagement
		2. Behavior
		3. With teacher
		4. With other students (e.g. Partner work, collaboration)
Recognition of teacher and teaching	Disposition	1. Professional personal experiences
		2. Mathematics class can be used as a cultural, social and political development
		3. Commitment to children and their families
		4. Disrupting inequitable practices and negative assumptions about students
		5. Learning is constructive and done by the community
	Planning and design considerations	1. Lesson/Unit plan design & learning goals for students
		2. Classroom environment & physical space (e.g. Seating chart, notebooks)
		3. Instructional decisions and/or choices while teaching
	Practices that disrupt patterns of inequity	1. Building trust and developing relationships with students and families
		2. Having high expectations
		3. Implementing norms and routines for discourse (e.g. listening, disrupting that only right answers go the board)
		4. Physical presence (tone, body language posture)
		5. Maintaining focus on content
		6. Assigning competence and positioning students
		7. Interrupting punishment practices (e.g. nonresponses)
		8. Discussion leading practices (e.g. revoicing, turn and talk)

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